ROWAN COUNTY

EMERGENCY SERVICES

EMS DIVISION

Be an original.

EMS System Protocols

Released September 2018

Revised December 2017

2017 NCCEP Treatment Protocol Index

Protocol Introduction PI (Black)

Universal Protocols UP (Green 4)

Airway Respiratory Section AR (Blue 7)

AR-1. Adult Airway

AR-2. Adult, Failed Airway

AR-3. Airway, Drug Assisted

AR-4. COPD / Asthma

AR-5. Pediatric Airway

AR-6. Pediatric Failed Airway

AR-7. Pediatric Respiratory Distress

AR-8 Post-intubation / BIAD Management

AR-9. Ventilator Emergencies

AR-10. Tracheostomy Tube Emergencies

Adult Cardiac Section AC (Blue 8)

AC-1. Adult Asystole / Pulseless Electrical Activity

AC-2. Bradycardia; Pulse Present

AC-3. Cardiac Arrest; Adult

AC-4. Chest Pain: Cardiac and STEMI

AC-5. CHF / Pulmonary Edema

AC-6. Adult Tachycardia Narrow Complex ($\leq$ 0.11 sec)

AC-7. Adult Tachycardia Wide Complex ($\geq$ 0.12 sec)

AC-8. Ventricular Fibrillation Pulseless Ventricular Tachycardia

AC-9. Post Resuscitation

AC-10. Targeted Temperature Management with ROSC (Optional)

AC-11. Adult Team Focused CPR (Optional)

AC-12. Onscene Resuscitation / Termination of CPR (Optional)

Adult Medical Section AM (Blue 9)

AM-1. Allergic Reaction / Anaphylaxis

AM-2. Diabetic; Adult

AM-3. Dialysis / Renal Failure

AM-4. Hypertension

AM-5. Hypotension / Shock

AM-6. Stroke; Activase / t-PA Transfer (Optional)

Adult Obstetrical Section AO

AO-1. Childbirth / Labor

AO-2. Newly Born

AO-3. Obstetrical Emergency

Trauma and Burn Section TB (Red 2)

TB-1. Blast Injury / Incident

TB-2. Chemical and Electrical Burn

TB-3. Crush Syndrome Trauma

TB-4. Extremity Trauma

TB-5. Head Trauma

TB-6. Multiple Trauma

TB-7. Radiation Incident

TB-8. Spinal Motion Restriction

TB-9. Thermal Burn

TB-10. Traumatic Arrest (Optional)

Pediatric Cardiac Section PC (Purple Accent 3)

PC-1. Pediatric Asystole / PEA

PC-2. Pediatric Bradycardia

PC-3. Pediatric Pulmonary Edema / CHF

PC-4. Pediatric Pulseless Arrest

PC-5. Pediatric Tachycardia

PC-6. Pediatric Ventricular Fibrillation / Pulseless VT

PC-7. Pediatric Post Resuscitation

Pediatric Medical Section PM (Purple Accent Darker 50%)

PM-1. Pediatric Allergic Reaction

PM-2. Pediatric Diabetic

PM-3. Pediatric Hypotension / Shock

Toxin-Environmental Section TE (Orange 3)

TE-1. Bites and Envenomation

TE-2. Carbon Monoxide / Cyanide

TE-3. Drowning

TE-4. Hyperthermia

TE-5. Hypothermia / Frostbite

TE-6. Marine Envenomation / Injury

TE-7. Overdose / Toxic Ingestion

TE-8. WMD – Nerve Agent Protocol

Special Circumstances Section SC

SC-1. Ebola; Suspected

SC-2. Ebola; Suspected - EMS Unit Decontamination

SC-3. Ebola; Suspected - Safe Transportation of Human Remains

Special Operations Section SO

SO-1. Scene Rehabilitation: General (Optional)

SO-2. Scene Rehabilitation: Responder (Optional)

Introduction

The following medical treatment protocols are developed for North Carolina EMS agencies. The process has evolved since 2007 and continues with input from Medical Directors, EMS Administration, North Carolina Chapter of Emergency Physicians Protocol Committee, North Carolina Office of EMS, EMS field personnel and the public at large through on-line surveys, public meetings across North Carolina and direct communication with stakeholders. The 2017 update expands on the 2012 and 2009 version and continues to incorporate evidence-based guidelines, expert opinion and historically proven practices meant to ensure that citizens and visitors of North Carolina will continue to be provided the highest quality pre-hospital patient care available. The North Carolina Chapter of Emergency Physicians develops and provides final approval.

The purpose of the protocol section is to provide treatment protocols outlining permissible and appropriate assessment, delivery of care, reassessment and procedures which may be rendered by pre-hospital providers. The protocols also outline which medical situations require direct voice communication with medical control. In general treatment protocols are specific orders which may and should be initiated prior to contact with Medical Control.

Please note the medical protocols are divided into three (3) to four (4) sections. The upper section includes three (3) boxes (History, Signs and Symptoms and Differential) which serves as a guide to assist in obtaining pertinent patient information and exam findings as well as considering multiple potential causes of the patients complaint. It is not expected that every historical element or sign / symptom be recorded for every patient. It is expected that those elements pertinent to your patient encounter will be included in the patient evaluation.

The algorithm section describes the essentials of patient care. Virtually every patient should receive the care outlined in this section, usually in the order described. However each medical emergency must be dealt with individually and appropriate care determined accordingly. Professional judgment is mandatory in determining treatment modalities within the parameters of these protocols. Circumstances will arise where treatment may move ahead in the algorithm, move outside to another protocol and then re-enter later. While protocols are written based on body systems and primary complaints the patient should be treated as a whole and therefore the protocols should be considered as a whole in providing care.

Professional judgment hierarchy:

The pre-hospital provider may determine that no specific treatment is needed;
Or
The pre-hospital provider may follow the appropriate treatment protocols and then consult Medical Control;
Or
The pre-hospital provider may consult Medical Control before initiating any specific treatment.

Some protocols will encompass two (2) pages. Protocols which exist in a single page format may have page 2 added by the local medical director. The PEARLS section will either be located at the bottom of page 1 (single page protocol) or page 2 (double page protocol). The PEARLS section provides points regarding the main protocol based on evidence to date, common medical knowledge and expert medical opinion.

Information boxes highlighted in purple. These areas are editable at the local level. They will mainly involve specific medications and dosages utilized by the local EMS agency. Page 2 will have a large section highlighted in purple where the local Medical Director may edit as they see fit to provide expanded points and treatment not otherwise specified in the algorithm. If the box is not to be utilized – add "***This Space Left Blank Intentionally***."

Finally these medical treatment protocols are established to ensure safe, efficient and effective interventions to relieve pain and suffering and improve patient outcomes without inflicting harm. They also serve to ensure a structure of accountability for Medical Directors, EMS agencies, pre-hospital providers and facilities to provide continual performance improvement. A recent report of the Institute of Medicine calls for the development of standardized, evidence-based pre-hospital care protocols for the triage, treatment and transport of patients. These protocols establish expectations of pre-hospital care in North Carolina.

Key to Protocol Utilization

History
- Important history items
- Circumstances of event
- SAMPLE
- Time of onset
- Duration

Signs and Symptoms
- Important Signs and Symptoms specific to each protocol

Differential
- A list of other disease or injury which should be considered

Black Box

Hightlights Important Information

Universal Patient Care Protocol
Assumed all protocols utilize and will not appear on individual protocols

Red Box

Highlights Critical Information

May direct to another protocol

Signals protocol within a protocol

Indicates Entry / Exit from / to to another protocol(s)

Information box

Decision Point
Darker outline to highlight

Highlights medication after Contact Medical Control
May be added by Local Medical Director

Purple Shading of Information Box
Indicates items changeable at local agency level, including medications / dosages on NCMB formulary
Local Medical Director may add / change at his / her discretion
Local medical director may add page 2 to any protocol where none exists for additional comments

Algorithm Legend	
	Emergency Medical Responder
B	Emergency Medical Technician
A	Advanced Emergency Medical Technician
P	Paramedic
	Notify Destination or Contact Medical Control

Pearls
- Important information specific to each protocol will appear here.
- Will usually appear on page.
- Important exam items listed here specific to protocol.

Universal Patient Care

Scene Safe

NO

YES

Call for help / additional resources
Stage until scene safe

Bring all necessary equipment to patient
Demonstrate professionalism and courtesy
Mass assembly consider WMD

Utilize appropriate PPE

Consider Airborne, Contact, or Droplet Isolation ***if indicated***

Initial assessment
BLS maneuvers
Initiate oxygen ***if indicated***

Adult Assessment Procedure

Pediatric Assessment Procedure
Use Broselow-Luten tape

Required VS:
Blood pressure
Palpated pulse rate
Respiratory rate
Pulse ox if available

If Indicated:
Glucose
12 Lead ECG
Temperature
Pain scale
CO Monitoring
EtCO2 Monitoring

Medical or Trauma

Trauma Patient

Evaluate MOI

Significant MOI

Primary and Secondary trauma assessment

No Significant MOI

Primary and Secondary trauma assessment

Focused assessment on specific injury

Medical Patient

Mental Status Exam

Unresponsive

Primary and secondary assessment

Obtain history of present illness from available sources / scene survey

Responsive

Obtain Chief Complaint

Primary and Secondary assessment
Focused assessment on specific complaint

Spinal Motion Restriction Procedure / Protocol TB 8 ***as indicated***

Obtain VS

Obtain SAMPLE

Repeat assessment while preparing for transport

Exit to
Age Appropriate Protocol(s)
as indicated

Continue on-going assessment
Repeat initial VS
Evaluate interventions / procedures

Transfer
Patient hand-off includes patient information, personal property and summary of care and response to care

Patient does not fit specific protocol

Notify Destination or Contact Medical Control

Universal Protocol Section

Universal Patient Care

Scene Safety Evaluation:
Identify potential hazards to rescuers, patient and public.
Identify number of patients and utilize START protocol if indicated.
Observe patient position and surroundings.

General:
All patient care must be appropriate to your level of training and documented in the PCR.

The PCR / EMR narrative should be considered a story of the circumstances, events and care of the patient and should allow a reader to understand the complaint, the assessment, the treatment, why procedures were performed and why indicated procedures were not performed as well as ongoing assessments and response to treatment and interventions.

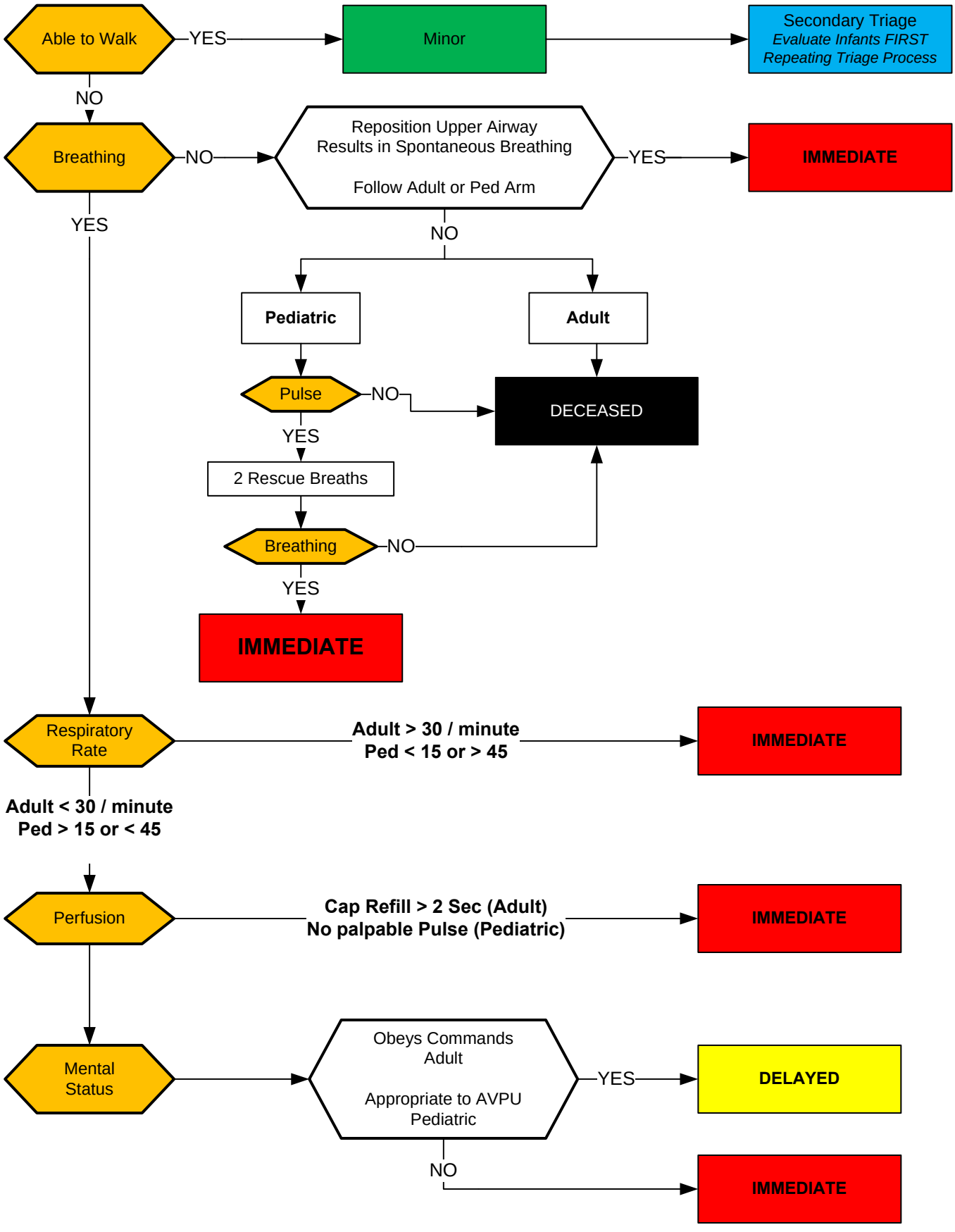
Adult Patient:
An adult is considered hypotensive when Systolic Blood Pressure is less than 90 mmHg.
Diabetic patients and women may have atypical presentations of cardiac related problems such as MI.
General weakness can be the symptom of a very serious underlying process.
Beta blockers and other cardiac drugs may prevent a reflexive tachycardia in shock with low to normal pulse rates.

Geriatric Patient:
Hip fractures and dislocations have high mortality.
Altered mental status is not always dementia. Always check Blood Sugar and assess signs of stroke, trauma, etc. with any alteration in a patient's baseline mental status.
Minor or moderate injury in the typical adult may be very serious in the elderly.

Special note on oxygen administration and utilization:
Oxygen is ubiquitous in prehospital patient care and probably over utilized. Oxygen is a pharmaceutical with indications, contraindications as well as untoward side effects. Recent research demonstrates a clear link with increased mortality when given in overdose (hyperoxia / hyperventiation) in cardiac arrest.
Utilize oxygen when indicated and not because it is available. A reasonable target oxygen saturation in all treatment protocols is 94 % regardless of delivery device.

- **Pearls**
- **Recommended Exam: Minimal exam if not noted on the specific protocol is vital signs, mental status with GCS, and location of injury or complaint.**
- **Any patient contact which does not result in an EMS transport must have a completed disposition form.**
- **Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.**
- **2 complete vital sign acquisitions should occur at a minimum with a patient encounter.**
- **Patient Refusal**
  Patient refusal is a high risk situation. Encourage patient to accept transport to medical facility.
  Encourage patient to allow an assessment, including vital signs. Documentation of the event is very important including a mental status assessment describing the patient's capacity to refuse care.
  Guide to Assessing capacity:
  C:***Patient should be able to communicate a clear choice:*** This should remain stable over time. Inability to communicate a choice or an inability to express the choice consistently demonstrates incapacity.
  R: ***Relevant information is understood:*** Patient should be able to display a factual understanding of the illness, the options and risks and benefits.
  A: ***Appreciation of the situation:*** Ability to communicate an understanding of the facts of the situation. They should be able to recognize the significance of the outcome potentially from their decision.
  M: ***Manipulation of information in a rational manner:*** Demonstrate a rational process to come to a decision. Should be able to describe the logic they are using to come to the decision, though you may not agree with decision.
- **Pediatric Patient General Considerations:**
  A pediatric patient is defined by fitting a Length-based Resuscitation Tape, Age ≤ 15, weight ≤ 49 kg.
  Patients off the Length-Based color coded tape should have weight based medications until age ≥ 16 or weight ≥ 50 kg.
  Special needs children may require continued use of Pediatric based protocols regardless of age and weight.
  Initial assessment should utilize the Pediatric Assessment Triangle which encompasses Appearance, Work of Breathing and Circulation to skin.
  The order of assessment may require alteration dependent on the developmental state of the pediatric patient. Generally the child or infant should not be separated from the caregiver unless absolutely necessary during assessment and treatment.
- Timing of transport should be based on patient's clinical condition and the transport policy.
- Never hesitate to contact medical control for patient who refuses transport.
- Blood Pressure is defined as a Systolic / Diastolic reading. A palpated Systolic reading may be necessary at times.
- SAMPLE: Signs / Symptoms; Allergies; Medications; PMH; Last oral intake; Events leading to illness / injury

Triage


Able to Walk
YES
Minor
Secondary Triage
Evaluate Infants FIRST
Repeating Triage Process
NO
Breathing
NO
Reposition Upper Airway
Results in Spontaneous Breathing
Follow Adult or Ped Arm
YES
IMMEDIATE
YES
NO
Pediatric
Adult
Pulse
NO
DECEASED
YES
2 Rescue Breaths
Breathing
NO
YES
IMMEDIATE
Respiratory Rate
Adult > 30 / minute
Ped < 15 or > 45
IMMEDIATE
Adult < 30 / minute
Ped > 15 or < 45
Perfusion
Cap Refill > 2 Sec (Adult)
No palpable Pulse (Pediatric)
IMMEDIATE
Mental Status
Obeys Commands
Adult
Appropriate to AVPU
Pediatric
YES
DELAYED
NO
IMMEDIATE

Triage

Add info about secondary triage after initial treatment – SMART Triage System

Pearls

- .**When approaching a multiple casualty incident where resources are limited:**
  Triage decisions must be made rapidly with less time to gather information
  Emphasis shifts from ensuring the best possible outcome for an individual patient to ensuring the best possible outcome for the greatest number of patients.
- **Scene Size Up:**
  1. **Conduct a scene size up. Assure well being of responders. Determine or ensure scene safety before entering. If there are several patients with the same complaints consider HazMat, WMC or CO poisoning.**
  2. **Take Triage system kit.**
  3. **Determine number of patients. Communicate the number of patients and nature of the incident, establish command and establish a medical officer and triage officer if personnel available**
- **Triage is a continual process and should recur in each section as resources allow.**
- **Step 1: Global sorting:**
  Call out to those involved in the incident to walk to a designated area and assess third.
  For those who cannot walk, have them wave / indicate a purposeful movement and assess them second.
  Those involved who are not moving or have an obvious life threat, assess first.
- **Step 2: Individual assessments:**
  Control major hemorrhage
  Open airway and if child, give 2 rescue breaths
  Perform Needle Chest Decompression Procedure if indicated.
  Administer injector antidotes if indicated
- **Assess the first patient you encounter using the three objective criteria which can be remembered by RPM.**
  R: Respiratory
  P: Perfusion
  M: Mental Status
- If your patient falls into the RED TAG category, stop, place RED TAG and move on to next patient. Attempt only to correct airway problems, treat uncontrolled bleeding, or administer an antidote before moving to next patient.
- **Treatment:**
  Once casualties are triaged focus on treatment can begin. You may need to move patients to treatment areas.
  RED TAGs are moved / treated first followed by YELLOW TAGs. BLACK TAGs should remain in place.
  You may also indicate deceased patients by pulling their shirt / clothing over their head.
  As more help arrives then the triage / treatment process may proceed simultaneously.
- Capillary refill can be altered by many factors including skin temperature. Age-appropriate heart rate may also be used in triage decisions.
- SMART triage tag system is utilized in NC.

Abdominal Pain
Vomiting and Diarrhea

History
- Age
- Time of last meal
- Last bowel movement/emesis
- Improvement or worsening with food or activity
- Duration of problem
- Other sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history (pregnancy)
- Travel history
- Bloody emesis / diarrhea

Signs and Symptoms
- Pain
- Character of pain (constant, intermittent, sharp, dull, etc.)
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation

Associated symptoms:
Fever, headache, blurred vision, weakness, malaise, myalgias, cough, headache, dysuria, mental status changes, rash

Differential
- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- Myocardial infarction
- Drugs (NSAID's, antibiotics, narcotics, chemotherapy)
- GI or Renal disorders
- Diabetic ketoacidosis
- OB-Gyn disease (ovarian cyst, PID, Pregnancy)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or toxin induced
- Medication or Substance abuse
- Psychological

Consider
Blood Glucose Analysis
Procedure

B 12 Lead ECG Procedure

A IV Procedure

P Cardiac Montior

Age Appropriate Diabetic
Protocol AM 2 / PM 2
if indicated

Pain Control
Protocol UP 11
if indicated

Age Appropriate Cardiac
Protocol(s)
if indicated

Serious Signs / Symptoms
Hypotension, poor
perfusion, shock

YES →

A IV / IO Procedure
Consider 2 Large Bore sites

Normal Saline 500 mL Bolus
Repeat as needed
Titrate SBP ≥ 90 mmHg
Maximum 2 L
Peds: 20 mL/kg IV / IO
Repeat as needed
Titrate to
Age Appropriate
SBP ≥ 70 + 2 x Age
Maximum 60 mL/kg

P **Odansetron 4 mg**
IV / IO / ODT / IM
Peds: 0.2 mg/kg PO / ODT
Peds Maximum 4 mg
May repeat in 15 minutes

Age Appropriate
Hypotension / Shock
Protocol AM 5 / PM 3
if indicated

NO

A **Normal Saline IV TKO**
Or Saline Lock

P **Odansetron 4 mg**
IV / IO / ODT / IM
Peds: 0.2 mg/kg PO / ODT
Peds Maximum 4 mg
May repeat in 15 minutes
If no response
Promethazine
12.5 mg IV/ IO / IM
May repeat x 1 as needed

Monitor and Reassess

Notify Destination or
Contact Medical Control

Universal Protocol Section

Abdominal Pain
Vomiting and Diarrhea

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age) mmHg and 11 years and older > 90 mmHg.**
- **Abdominal / back pain in women of childbearing age should be treated as pregnancy related until proven otherwise.**
- **The diagnosis of abdominal aneurysm should be considered with abdominal pain, with or without back and / or lower extremity pain or diminished pulses, especially in patients over 50 and / or patients with shock/ poor perfusion. Notify receiving facility early with suspected abdominal aneurysm.**
- **Consider cardiac etiology in patients > 50, diabetics and / or women especially with upper abdominal complaints.**
- **Repeat vital signs after each fluid bolus.**
- **Heart Rate: One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.**
- **Promethazine (Phenergan) may cause sedative effects in pediatric patients and ages ≥ 60 and the debilitated, etc.) When giving promethazine IV dilute with 10 mL of normal saline and administer slowly as it can also harm the veins.**
- Document the mental status and vital signs prior to administration of Promethazine (Phenergan).
- Isolated vomiting (especially in children) may be caused by pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures).
- Vomiting and diarrhea are common symptoms, but can be the symptoms of uncommon and serious pathology such as stroke, carbon monoxide poisoning, acute MI, new onset diabetes, diabetic ketoacidosis (DKA), and organophosphate poisoning. Maintain a high index of suspicion.

Altered Mental Status

History
- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Change in condition
- Changes in feeding or sleep habits

Signs and Symptoms
- Decreased mental status or lethargy
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration)
- Irritability

Differential
- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Hypothermia
- Infection (CNS and other)
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological or Ingestion
- Acidosis / Alkalosis
- Environmental exposure
- Pulmonary (Hypoxia)
- Electrolyte abnormality
- Psychiatric disorder

	Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***if indicated***
	Blood Glucose Analysis Procedure
B	12 Lead ECG Procedure
A	IV / IO Procedure
	Age Appropriate Diabetic Protocol(s) AM 2 / PM 2 ***if indicated***

Signs of shock / Poor perfusion Traumatic Injury
- YES → Exit to Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3, Multiple Trauma Protocol TB 6, Head Injury Protocol TB 5
- NO ↓

Signs of OD / Toxicology
- YES → Exit to Overdose / Toxic Exposure Protocol TE 7
- NO ↓

Signs of CVA Or Seizure
- YES → Exit to Suspected Stroke Protocol UP 14, Seizure Protocol UP 13
- NO ↓

Signs of Hypo / Hyperthermia
- YES → Exit to Hypothermia Protocol TE 5, Hyperthermia Protocol TE 4
- NO ↓

Arrhythmia / STEMI / CP
- YES → Exit to Age Appopriate Appropriate Cardiac Protocol(s)
- NO ↓

Fever / Sepsis
- YES → Exit to Fever Protocol UP 10, Suspected Sepsis Protocol UP 15
- NO ↓

Notify Destination or Contact Medical Control

Universal Protocol Section

Altered Mental Status

Pearls

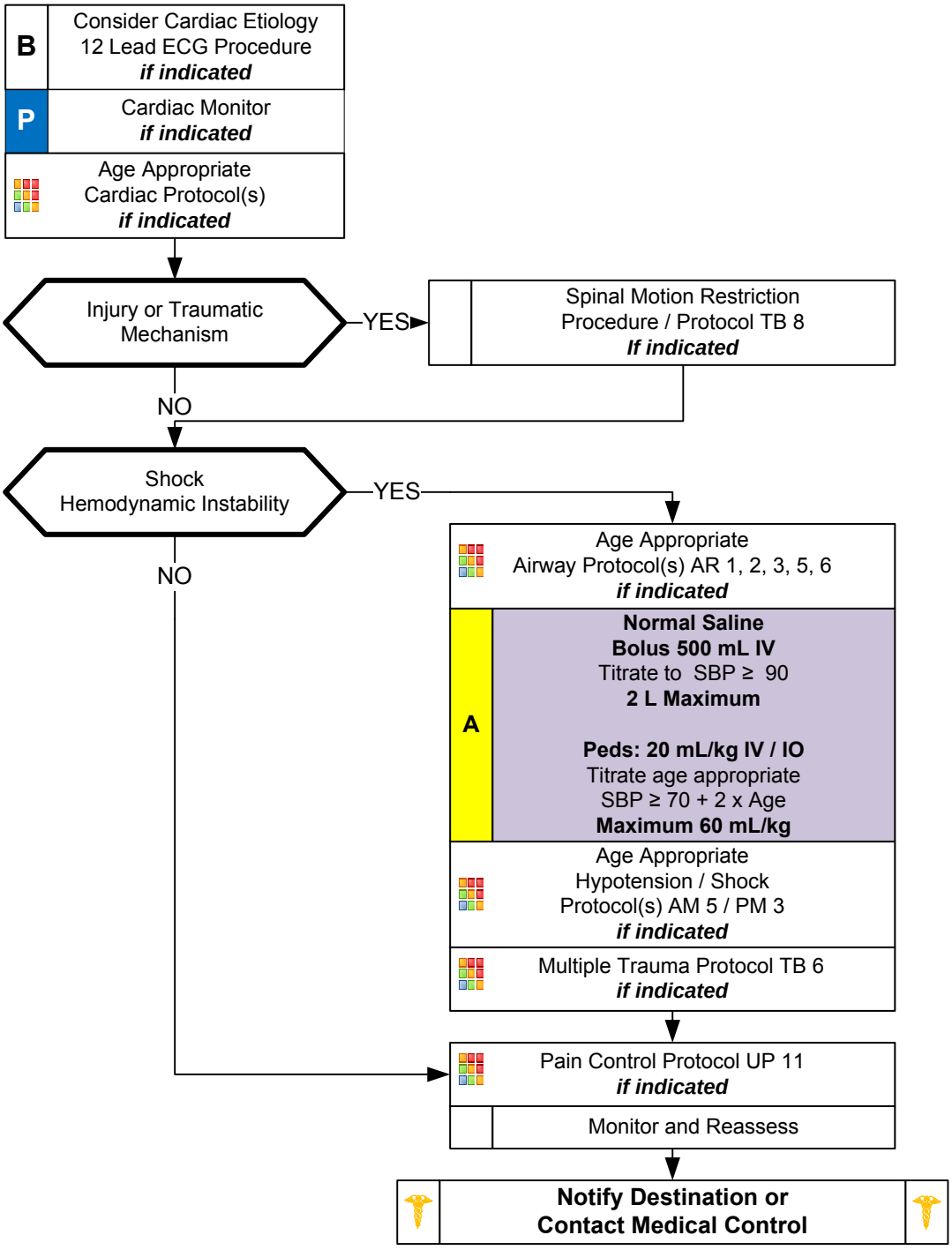
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro.**
- **AMS may present as a sign of an environmental toxin or Haz-Mat exposure - protect personal safety.**
- **General:**
  - **The patient with AMS poses one of the most significant challenges.**
  - **A careful assessment of the patient, the scene and the circumstances should be undertaken.**
  - **Assume the patient has a life threatening cause of their AMS until proven otherwise.**
  - **Pay careful attention to the head exam for signs of bruising or other injury.**
  - **Information found at the scene must be communicated to the receiving facility.**
- **Substance misuse:**
  - Patients ingesting substances can pose a great challenge.
  - DO NOT assume recreational drug use and / or alcohol are the sole reasons for AMS.
  - Misuse of alcohol may lead to hypoglycemia.
  - More serious underlying medical and trauma conditions may be the cause.
- **Behavioral health:**
  - The behavioral health patient may present a great challenge in forming a differential.
  - DO NOT assume AMS is the result solely of an underlying psychiatric etiology.
  - Often an underlying medial or trauma condition precipitates a deterioration of a patients underlying disease.
- **Spinal Motion Restriction / Trauma:**
  - Only utilize spinal immobilization if the situation warrants.
  - The patient with AMS may worsen with increased agitation when immobilized.
- **It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon**
- Consider Restraints if necessary for patient's and/or personnel's protection per the restraint procedure.

Back Pain

History
- Age
- Past medical history
- Past surgical history
- Medications
- Onset of pain / injury
- Previous back injury
- Traumatic mechanism
- Location of pain
- Fever
- Improvement or worsening with activity

Signs and Symptoms
- Pain (paraspinous, spinous process)
- Swelling
- Pain with range of motion
- Extremity weakness
- Extremity numbness
- Shooting pain into an extremity
- Bowel / bladder dysfunction

Differential
- Muscle spasm / strain
- Herniated disc with nerve compression
- Sciatica
- Spine fracture
- Kidney stone
- Pyelonephritis
- Aneurysm
- Pneumonia
- Spinal Epidural Abscess
- Metastatic Cancer
- AAA



Universal Protocol Section

Back Pain

Kidney Stones: Initial Pain Control is Morphine 2-4 mg up to 10mg then move to Hydromorphone if needed 1-2mg

Universal Protocol Section

Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Neuro, Lower extremity perfusion**
- **Back pain is one of the most common complaints in medicine and effects more than 90 % of adults at some point in their life. Back pain is also common in the pediatric population. Most often it is a benign process but in some circumstances can be life or limb threatening.**
- **Consider pregnancy or ectopic pregnancy with abdominal or back pain in women of childbearing age.**
- **Consider abdominal aortic aneurysm with abdominal pain especially in patients over 50 and/or patients with shock/ poor perfusion. Patients may have abdominal pain and / or lower extremity pain with diminished pulses, . Notify receiving facility early with suspected abdominal aneurysm.**
- **Consider cardiac etiology in patients > 50, diabetics and / or women especially with upper abdominal complaints.**
- **Red Flags which may signal more serious process associated with back pain:**
  - Age > 50 or < 18
  - Neurological deficit (leg weakness, urinary retention, or bowel incontinence)
  - IV Drug use
  - Fever
  - History of cancer, either current or remote
  - Night time pain in pediatric patients
- **Cauda equina syndrome is where the terminal nerves of spinal cord are being compressed (Symptoms include):.**
  - Saddle anesthesia
  - Recent onset of bladder and bowel dysfunction. (Urine retention and bowel incontinence)
  - Severe or progressive neurological deficit in the lower extremity.
  - Motor weakness of thigh muscles or foot drop
- **Back pain associated with infection:**
  - Fever / chills.
  - IV Drug user (consider spinal epidural abscess)
  - Recent bacterial infection like pneumonia.
  - Immune suppression such as HIV or patients on chronic steroids like prednisone.
  - Meningitis.
- **Spinal motion restriction in patients with underlying spinal deformity should be maintained in their functional position.**
- Kidney stones typically present with an acute onset of flank pain which radiates around to the groin area.

Behavioral

NCOEMS Ketamine Pilot Project

History
- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medic alert tag
- Substance abuse / overdose
- Diabetes

Signs and Symptoms
- Anxiety, agitation, confusion
- Affect change, hallucinations
- Delusional thoughts, bizarre behavior
- Combative violent
- Expression of suicidal / homicidal thoughts

Differential
- Altered Mental Status differential
- Alcohol Intoxication
- Toxin / Substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders

Blood Glucose Analysis Procedure ***if indicated***

Age Appropriate Diabetic Protocol AM 3 / PM 2 if indicated

Altered Mental Status Protocol UP 4
Overdose / Toxic Ingestion Protocol TE 7 if indicated

Head Trauma Protocol TB 5
Multiple Trauma Protocol TB 6 if indicated

Call for help / additional resources
Stage until scene safe

Excited Delirium Syndrome
Paranoia, disorientation, hyper-aggression, hallucination, tachycardia, increased strength, hyperthermia

YES

P — **Ketamine 400 mg IM**
See Pearls

P — **Midazolam 2.5 mg IV / IO / IN**
5 mg IM
Age ≥ 65
1 – 2.5 mg IV / IO / IN
2.5 mg IM
Peds: 0.1 – 0.2 mg/kg
IV / IO / IM / IN
Repeat every 2-3 minutes as needed

NO

Aggressive, Violent, Agitation

Threat to Self / others
Setting of Psychosis

YES

Consider Restraint Physical Procedure

Monitor per restraint procedure ***if indicated***

A — IV / IO Procedure

A — IV / IO Procedure
Preferably 2 large bore

A — **Normal Saline 1 L Bolus**
Then **150 – 200 mL / hr**
May repeat **500 mL** Bolus as needed
Maximum 2 L
Peds: 20 – 60 mL/kg IV / IO
Maximum 60 mL/kg

P — Age ≥ 12
Haloperidol 2 - 5 mg IM
Age ≥ 65
2.5 mg IM
May repeat every 5 as needed
Maximum 10 mg

P — **Midazolam 2.5 mg IV / IO / IN**
5 mg IM
Age ≥ 65
1 – 2.5 mg IV / IO / IN
2.5 mg IM
Peds: 0.1 – 0.2 mg/kg
IV / IO / IM / IN
Repeat every 2-3 minutes as needed

NO

P — Evaluation and Screening Mental Health and Substance Use Protocol CIT Paramedic Only

if available

Triage and Alternative Destination
Mental Health / Substance Abuse
If available

External Cooling Measures

Consider Restraint Physical Procedure

Monitor per restraint procedure ***if indicated***

P — Cardiac Monitor

Monitor and Reassess

Notify Destination or Contact Medical Control

Universal Protocol Section

Pearls

Recommended Exam: Mental Status, Skin, Heart, Lungs, Neuro

Crew / responders safety is the main priority.

Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.

Consider Haldol or Ziprasidone for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.

Haldol is acceptable treatment in pediatric patients ≥ 12 years old. Safety and efficacy is not established in younger ages.

All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.

Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)

Do not irritate the patient with a prolonged exam.

Do not overlook the possibility of associated domestic violence, child, or geriatric abuse.

Do not position or transport any restrained patient is such a way that could impact the patients respiratory or circulatory status.

Excited Delirium Syndrome:

Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers. Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.

Ketamine:

Agencies participating in the NCOEMS Ketamine Project must complete both Ketamine Evaluation Forms and submit to the Regional Specialist.

Use for Behavior limited to: Patients who no longer fit on a Pediatric Length-based Resuscitation Tape.

Ketamine administration requires continuous EtCO2 monitoring.

Ketamine Dissociation syndrome:

- Treatment includes benzodiazepines such as Midazolam, Lorazepam, or Diazepam. May require repeat dosing.
- Treatment also includes decreasing ambient stimuli such as sounds, lighting, or activity.
- Ketamine can cause apnea in the geriatric population.
- Ketamine may cause hypotension, hypertension, vomiting, respiratory depression, or laryngospasms. Laryngospasm responds to BVM.

If patient is suspected of EDS suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early

Extrapyramidal reactions:

Condition causing involuntary muscle movements or spasms typically of the face, neck and upper extremities. May present with contorted neck and trunk with difficult motor movements. Typically an adverse reaction to antipsychotic drugs like Haloperidol and may occur with your administration. When recognized give **Diphenhydramine 50 mg IV / IO / IM / PO** in adults or **1 mg/kg IV / IO / IM / PO** in pediatrics.

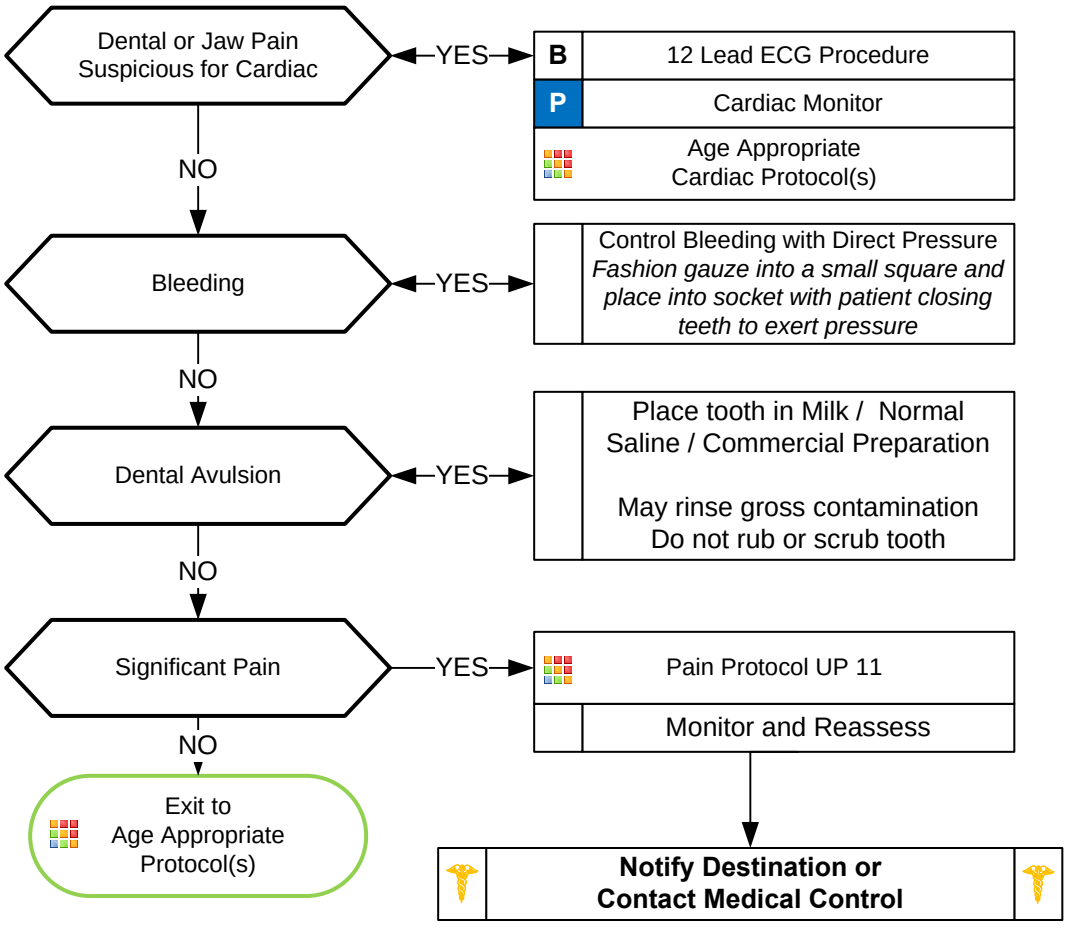
May add page 3 to protocol for specific for local mental health and / or substance misuse resources or destinations.

Dental Problems

History
- Age
- Past medical history
- Medications
- Onset of pain / injury
- Trauma with "knocked out" tooth
- Location of tooth
- Whole vs. partial tooth injury

Signs and Symptoms
- Bleeding
- Pain
- Fever
- Swelling
- Tooth missing or fractured

Differential
- Decay
- Infection
- Fracture
- Avulsion
- Abscess
- Facial cellulitis
- Impacted tooth (wisdom)
- TMJ syndrome
- Myocardial infarction



Universal Protocol Section

Pearls
- **Recommended Exam: Mental Status, HEENT, Neck, Chest, Lungs, Neuro**
- Significant soft tissue swelling to the face or oral cavity can represent a cellulitis or abscess.
- Scene and transport times should be minimized in complete tooth avulsions. Reimplantation is possible within 4 hours if the tooth is properly cared for.
- Occasionally cardiac chest pain can radiate to the jaw.
- All pain associated with teeth should be associated with a tooth which is tender to tapping or touch (or sensitivity to cold or hot).

Emergencies Involving Indwelling Central Lines

History

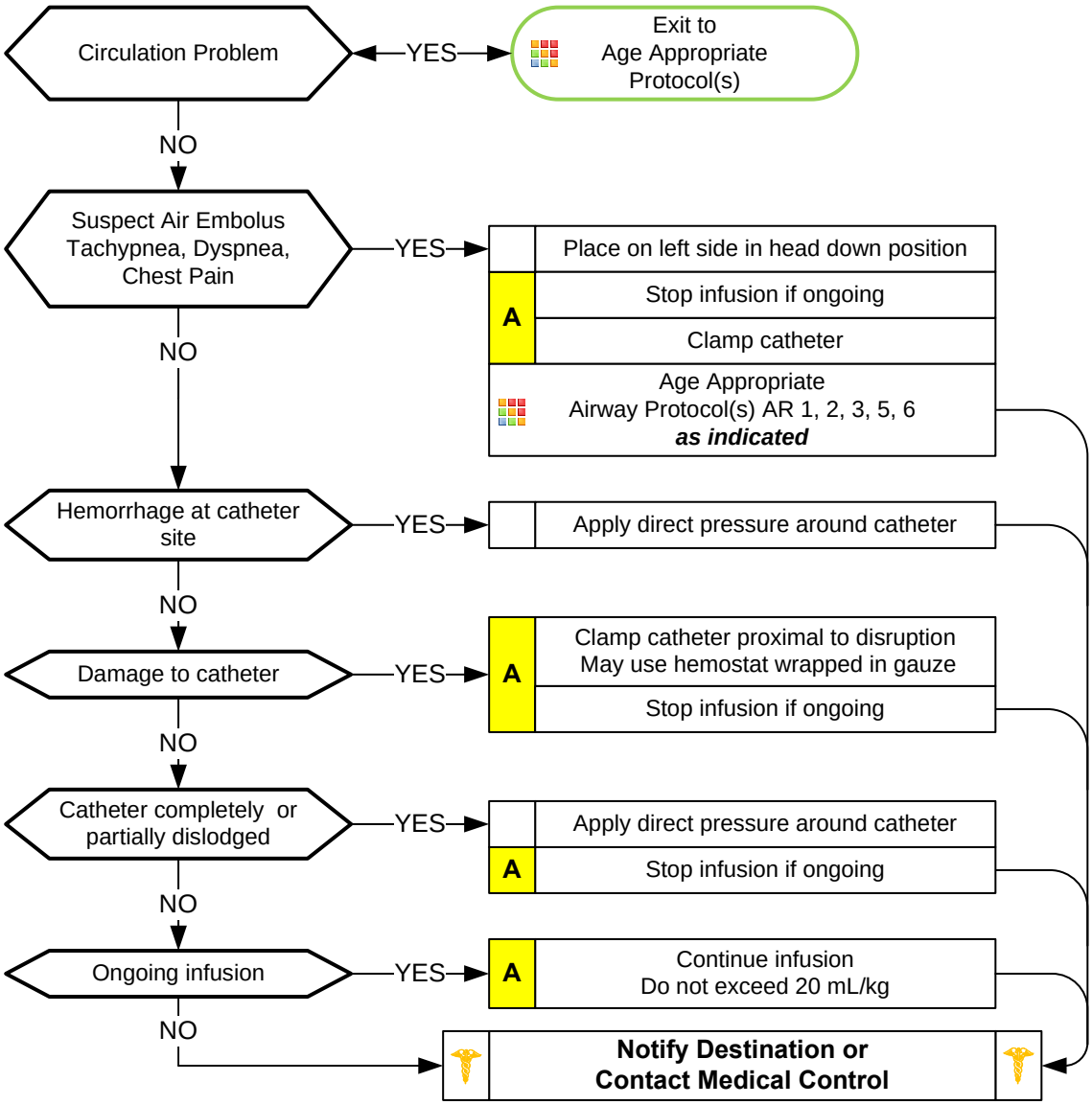
- Central Venous Catheter Type
  - Tunneled Catheter (Broviac / Hickman)
  - PICC (peripherally inserted central catheter
  - Implanted catheter (Mediport / Hickman)
- Occlusion of line
- Complete or partial dislodge
- Complete or partial disruption

Signs and Symptoms

- External catheter dislodgement
- Complete catheter dislodgement
- Damaged catheter
- Bleeding at catheter site
- Internal bleeding
- Blood clot
- Air embolus
- Erythema, warmth or drainage about catheter site indicating infection

Differential

- Fever
- Hemorrhage
- Reactions from home nutrient or medication
- Respiratory distress
- Shock



Universal Protocol Section

Pearls

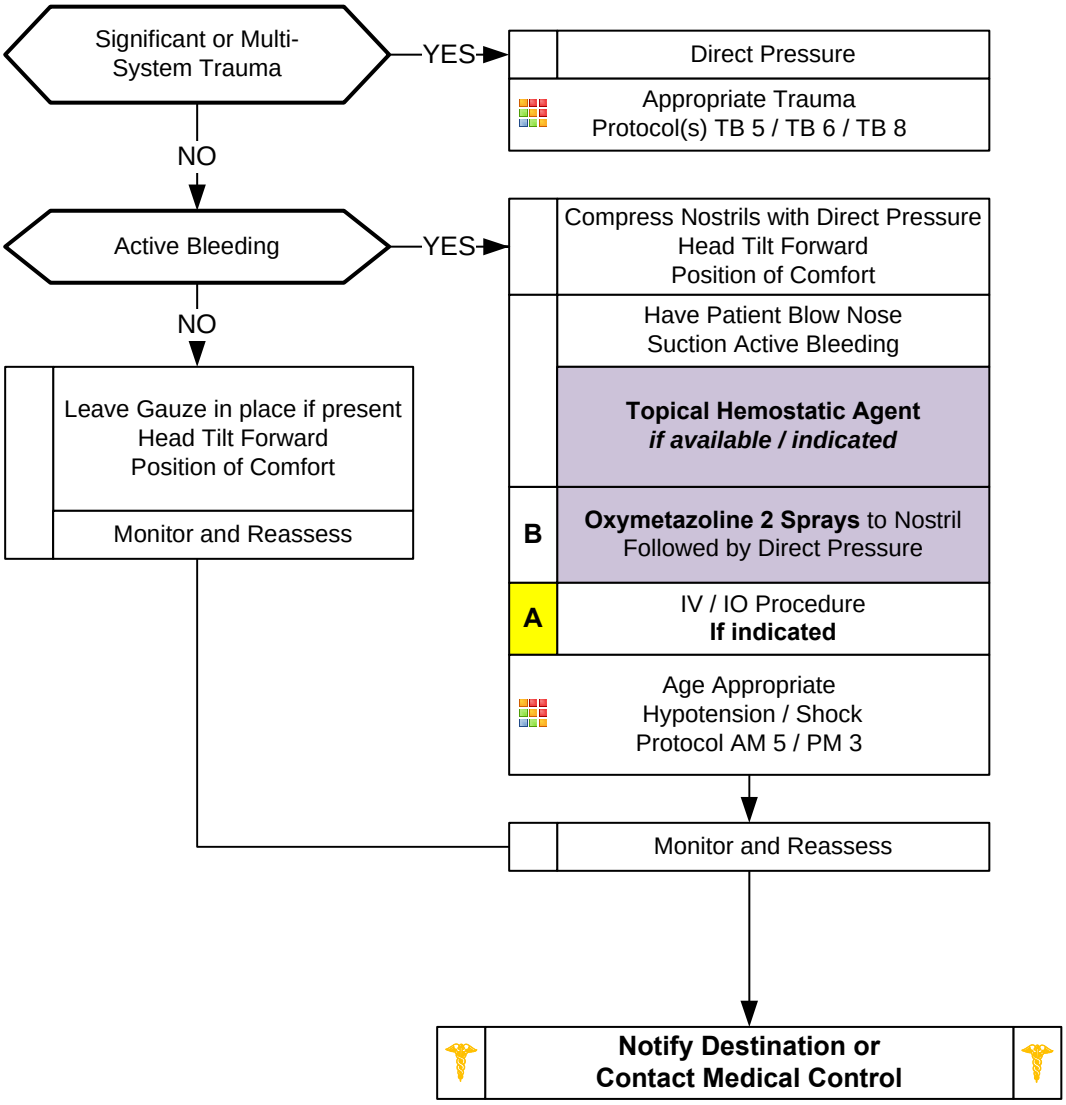
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **Use strict sterile technique when accessing / manipulating an indwelling catheter.**
- **Cardiac arrest: May access central catheter and utilize if functioning properly.**
- Do not attempt to force catheter open if occlusion evident.
- Some infusions may be detrimental to stop. Ask family or caregiver if it is appropriate to stop or change infusion.
- Hyperalimentation infusions (IV nutrition): If stopped for any reason monitor for hypoglycemia.

Epistaxis

History
- Age
- Past medical history
- Medications (HTN, anticoagulants, aspirin, NSAIDs)
- Previous episodes of epistaxis
- Trauma
- Duration of bleeding
- Quantity of bleeding

Signs and Symptoms
- Bleeding from nasal passage
- Pain
- Nausea
- Vomiting

Differential
- Trauma
- Infection (viral URI or Sinusitis)
- Allergic rhinitis
- Lesions (polyps, ulcers)
- Hypertension



Universal Protocol Section

Pearls
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Age specific hypotension: 0 – 28 days < 60 mmHg, 1 month – 1 year < 70 mmHg, 1 year – 10 years < 70 + (2 x age)mmHg, 11 years and greater < 90 mmHg.**
- It is very difficult to quantify the amount of blood loss with epistaxis.
- Bleeding may also be occurring posteriorly. Evaluate for posterior blood loss by examining the posterior pharnyx.
- Anticoagulants include warfarin (Coumadin), Apixaban (Elequis), heparin, enoxaparin (Lovenox), dabigatran (Pradaxa), rivaroxaban (Xarelto), and many over the counter headache relief powders.
- Anti-platelet agents like aspirin, clopidogrel (Plavix), aspirin/dipyridamole (Aggrenox), and ticlopidine (Ticlid) can contribute to bleeding.

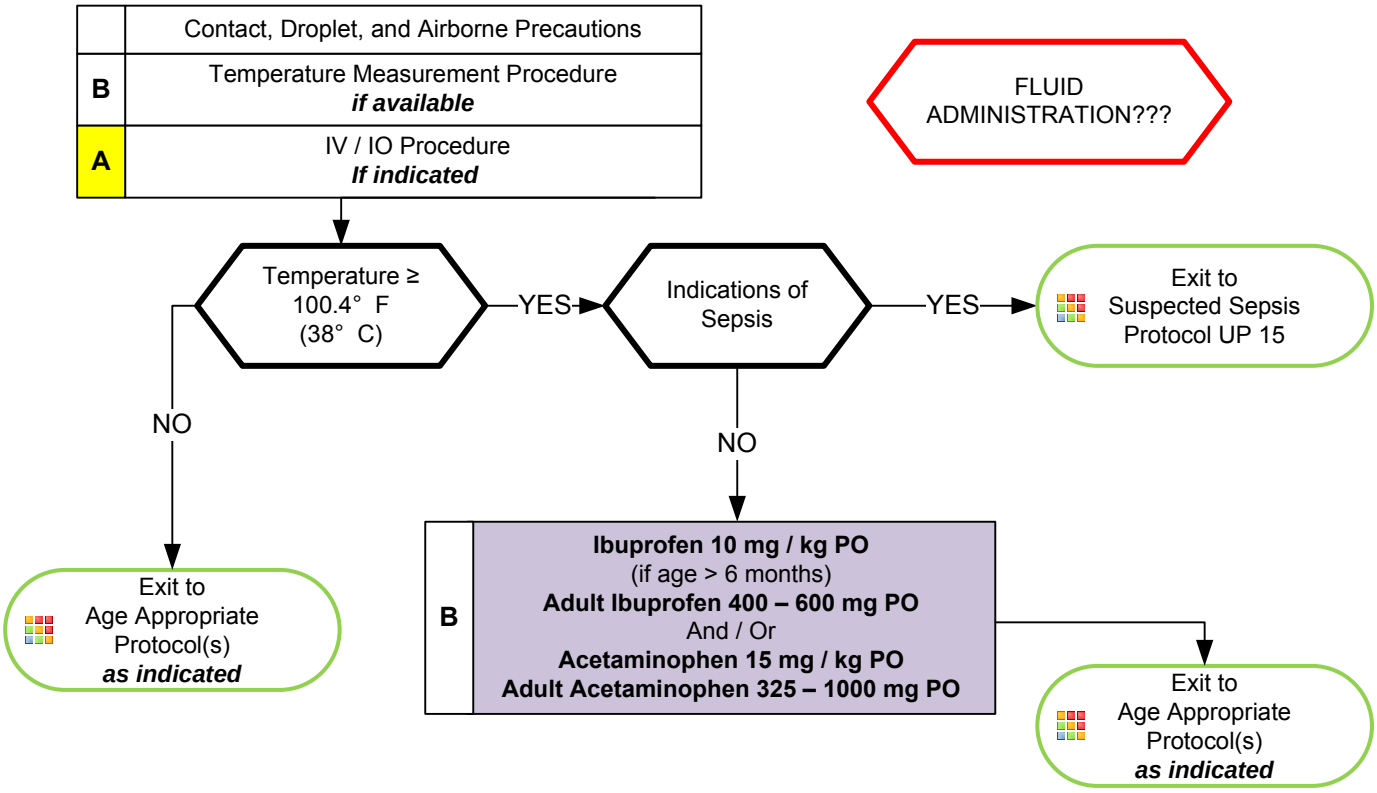
Fever / Infection Control

History
- Age
- Duration of fever
- Severity of fever
- Past medical history
- Medications
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Environmental exposure
- Last acetaminophen or ibuprofen

Signs and Symptoms
- Warm
- Flushed
- Sweaty
- Chills/Rigors

Associated Symptoms (Helpful to localize source)
- myalgias, cough, chest pain, headache, dysuria, abdominal pain, mental status changes, rash

Differential
- Infections / Sepsis
- Cancer / Tumors / Lymphomas
- Medication or drug reaction
- Connective tissue disease
  - Arthritis
  - Vasculitis
- Hyperthyroidism
- Heat Stroke
- Meningitis



Universal Protocol Section

Pearls
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Febrile seizures are more likely in children with a history of febrile seizures and with a rapid elevation in temperature.
- Patients with a history of liver failure should not receive acetaminophen.
- **Droplet precautions** include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient. This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected. A patient with a potentially infectious rash should be treated with droplet precautions.
- **Airborne precautions** include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.
- **All-hazards precautions** include standard PPE plus airborne precautions plus contact precautions. This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS).
- Rehydration with fluids increases the patient's ability to sweat and improves heat loss.
- All patients should have drug allergies documented prior to administering pain medications.
- Allergies to NSAIDs (non-steroidal anti-inflammatory medications) are a contraindication to Ibuprofen. Do not give to patients who have renal disease or renal transplant.
- NSAIDs should not be used in the setting of environmental heat emergencies.
- **Do not** give aspirin to a child, age ≤ 15 years.
- Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.

Pain Control

NCOEMS Ketamine Pilot Project

History
- Age
- Location
- Duration
- Severity (1 - 10)
- If child use Wong-Baker faces scale
- Past medical history
- Medications
- Drug allergies

Signs and Symptoms
- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

Differential
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic
- Renal (colic)

Enter from
Protocol based on **Specific Complaint**

Assess Pain Severity

Use combination of Pain Scale, Circumstances, MOI, Injury or Illness severity

Mild

B	**Ibuprofen 10 mg/kg PO** **(400 – 600 mg typical adult)** **Maximum 800 mg** **Or** **Acetaminophen 15 mg/kg** **(325 – 1000 mg typical adult)** **Maximum 1000 mg** **Or** **Aspirin 324 to 650 mg PO** **(≥ 16 only)**
A	Consider IV Procedure ***if indicated***

Moderate to Severe

	IV / IO Procedure
A	**Ketorolac 30 mg IV / IO** **60 mg IM** **Maximum 60 mg** **Peds: 0.5 mg/kg IV / IO / IM** **Maximum 30 mg**
	Cardiac Monitor
	Nitrous Oxide 50:50 Mix ***if available***
P	**Fentanyl 50 – 75 mcg IV / IO** Repeat **25 mcg** every 20 minutes **Maximum 200 mcg** **Peds: 1 mcg/kg IV / IO / IM / IN** May repeat 0.5 mg/kg every 5 minutes **Maximum 2 mcg/kg** Or **Morphine 4 mg IV / IO / IM** Repeat **2 mg** every 5 minutes as needed **Peds: 0.1 mg/kg IV / IO / IM** May repeat every 5 minutes **Maximum 10 mg**
	Ketamine 0.2 mg/kg IV / IO **Maximum 20 mg** Mix in 50 - 250 mL NS and Infuse over 10 minutes May repeat in 30 minutes as needed

Monitor and Reassess
Every 10 minutes following sedative

Notify Destination or
Contact Medical Control

Universal Protocol Section

Pain Control

NCOEMS Ketamine Pilot Project

Universal Protocol Section

Pearls

Recommended Exam: Mental Status, Area of Pain, Neuro

Pain severity (0-10) is a vital sign to be recorded before and after PO, IV, IO or IM medication delivery and at patient hand off. Monitor BP closely as sedative and pain control agents may cause hypotension.

Both arms of the treatment may be used in concert. For patients in Moderate pain for instance, you may use the combination of an oral medication and parenteral if no contraindications are present.

Pediatrics:

For children use Wong-Baker faces scale or the FLACC score (see Assessment Pain Procedure)

Use Numeric (> 9 yrs), Wong-Baker faces (4-16yrs) or FLACC scale (0-7 yrs) as needed to assess pain

Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.

All patients who receive IM or IV medications must be observed 15 minutes for drug reaction in the event no transport occurs.

Do not administer any PO medications for patients who may need surgical intervention such as open fractures or fracture deformities, headaches, or abdominal pain.

Ketorolac (Toradol) and Ibuprofen should not be used in patients with known renal disease or renal transplant, in patients who have known drug allergies to NSAID's (non-steroidal anti-inflammatory medications), with active bleeding, headaches, abdominal pain, stomach ulcers or in patients who may need surgical intervention such as open fractures or fracture deformities.

Do not administer **Acetaminophen** to patients with a history of liver disease.

Burn patients may required higher than usual opioid doses to titrate adequate pain control.

Consider agency-specific anti-emetic(s) for nausea and/or vomiting.

Ketamine:

Agencies participating in the NCOEMS Ketamine Project must complete both Ketamine Evaluation Forms and submit to the Regional Specialist.

Use for pain limited to: Patients who no longer fit on a Pediatric Length-based Resuscitation Tape to ≤ 65 years of age.

Must administer by IV / IO infusion over 10 minutes. Recommended volumes are 50 – 250 mL.

Ketamine Dissociation syndrome:

With rapid push or rapid infusion side effects such as hallucinations or agitation could occur. Doses ≥ 0.2 mg/kg may also cause similar symptoms. Symptoms may occur even with slow infusion.

Treatment includes benzodiazepines such as Midazolam, Lorazepam, or Diazepam. May require repeat dosing.

Treatment also includes decreasing ambient stimuli such as sounds, lighting, or activity.

Ketamine can cause apnea in the geriatric population.

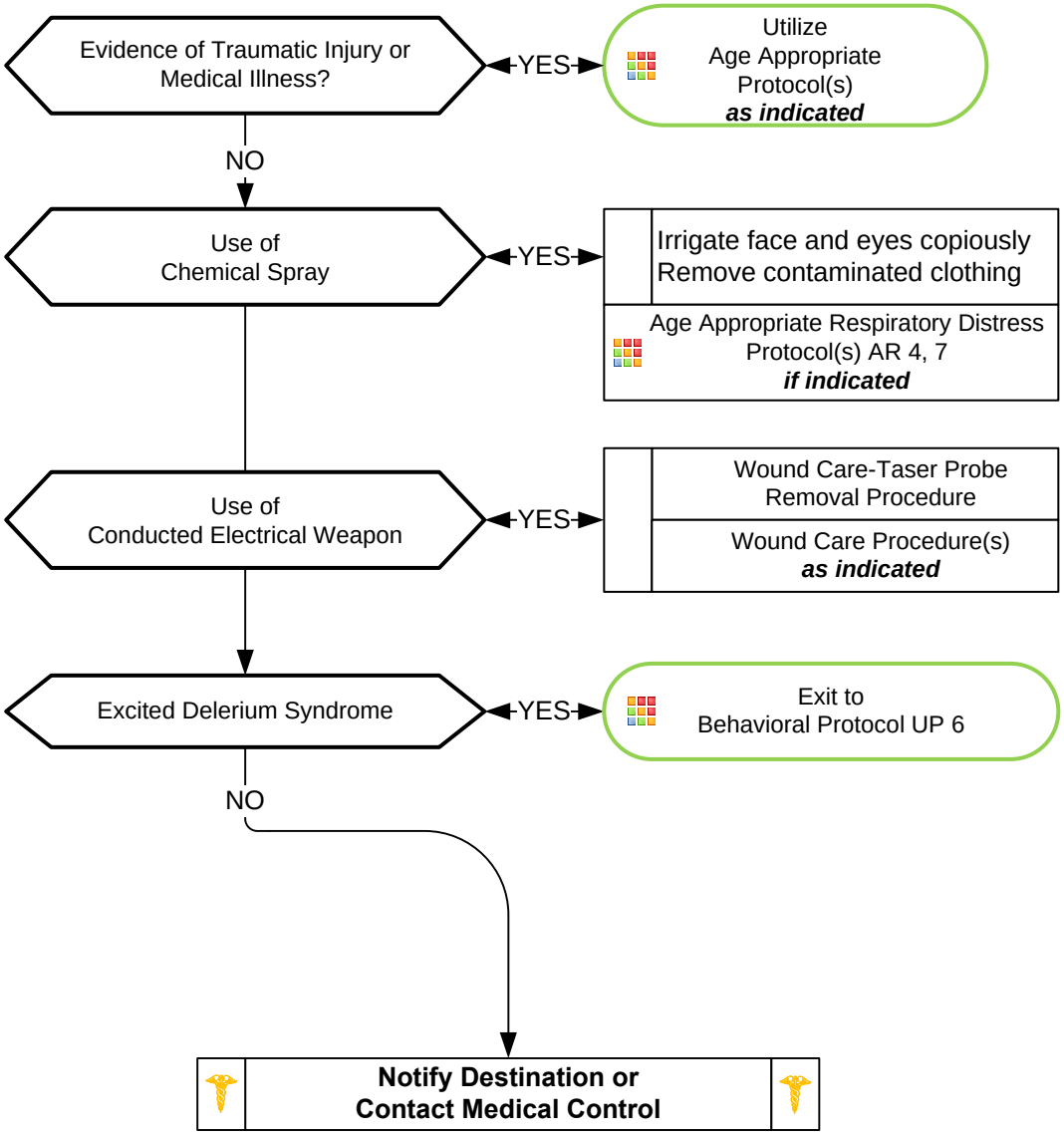
While uncommon, Ketamine may cause hypotension.

Police Custody

History
- Traumatic Injury
- Drug Abuse
- Cardiac History
- History of Asthma
- Psychiatric History

Signs and Symptoms
- External signs of trauma
- Palpitations
- Shortness of breath
- Wheezing
- Altered Mental Status
- Intoxication/Substance Abuse

Differential
- Agitated Delirium Secondary to Psychiatric Illness
- Agitated Delirium Secondary to Substance Abuse
- Traumatic Injury
- Closed Head Injury
- Asthma Exacerbation
- Cardiac Dysrhythmia



Universal Protocol Section

Police Custody

Patient's should not be hand cuffed to the stretcher.

Patients should not be restrained in the prone position.

Pearls

- **Patient does not have to be in police custody or under arrest to utilize this protocol.**
- **Local EMS agencies should formulate a policy with local law enforcement agencies concerning patients requiring EMS and Law Enforcement simultaneously. Agencies should work together to formulate a disposition in the best interest of the patient.**
- **Patients restrained by law enforcement devices must be transported accompanied by a law enforcement officer in the patient compartment who is capable of removing the devices. However when rescuers have utilized restraints in accordance with Restraint Procedure, the law enforcement agent may follow behind the ambulance during transport.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- The responsibility for patient care rests with the highest authorized medical provider on scene per North Carolina law.
- If an asthmatic patient is exposed to pepper spray and released to law enforcement, all parties should be advised to immediately contact EMS if wheezing/difficulty breathing occurs.
- All patients with decision-making capacity in police custody retain the right to participate in decision making regarding their care and may request care or refuse care of EMS.
- If extremity / chemical / law enforcement restraints are applied, follow Restraint Procedure.
- **Consider Haldol or Ziprasidone for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- **Haldol is acceptable treatment in pediatric patients ≥ 12 years old. Safety and efficacy is not established in younger ages.**
- **<u>Excited Delirium Syndrome:</u>**

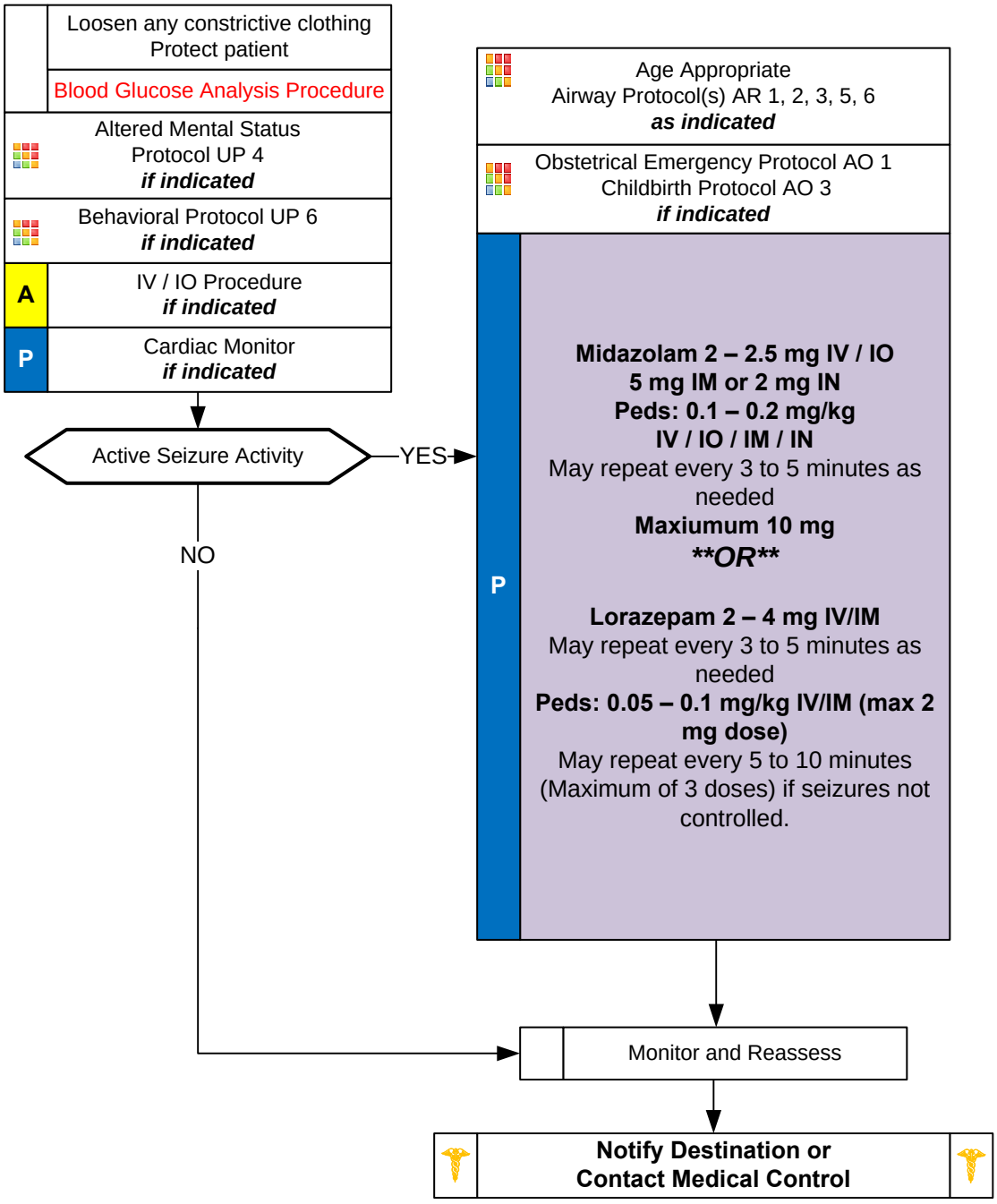
  Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers.
  Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.
  If patient suspected of EDS suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early.
- Do not position or transport any restrained patient is such a way that could impact the patients respiratory or circulatory status.
- Patients exposed to chemical spray, with or without history of respiratory disease, may develop respiratory complaints up to 20 minutes post exposure.

Seizure

History
- Reported / witnessed seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Document number of seizures
- Alcohol use, abuse or abrupt cessation
- Fever

Signs and Symptoms
- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious

Differential
- CNS (Head) trauma
- Tumor
- Metabolic, Hepatic, or Renal failure
- Hypoxia
- Electrolyte abnormality (Na, Ca, Mg)
- Drugs, Medications, Non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia



Universal Protocol Section

Seizure

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Adult:**
  Midazolam 5 – 10 mg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.
- **Pediatrics:**
  Midazolam 0.2 mg/kg (Maximum 10 mg) IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.
- **Status epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand mal seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures** affect only a part of the body and are not usually associated with a loss of consciousness, but can propagate to generalized seizures with loss of consciousness.
- Be prepared for airway problems and continued seizures.
- Assess possibility of occult trauma and substance abuse.
- In an infant, a seizure may be the only evidence of a closed head injury.
- Be prepared to assist ventilations especially if diazepam or midazolam is used.
- For any seizure in a pregnant patient, follow the OB Emergencies Protocol.
- Diazepam (Valium) is not effective when administered IM. Give IV or Rectally.
- Midazolam is well absorbed when administered IM.

Suspected Stroke

History
- Previous CVA, TIA's
- Previous cardiac / vascular surgery
- Associated diseases: diabetes, hypertension, CAD
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma
- Sickle Cell Disease
- Immune disorders
- Congenital heart defects
- Maternal infection / hypertension

Signs and Symptoms
- Altered mental status
- Weakness / Paralysis
- Blindness or other sensory loss
- Aphasia / Dysarthria
- Syncope
- Vertigo / Dizziness
- Vomiting
- Headache
- Seizures
- Respiratory pattern change
- Hypertension / hypotension

Differential
- See Altered Mental Status
- TIA (Transient ischemic attack)
- Seizure
- Todd's Paralysis
- Hypoglycemia
- Stroke
  Thrombotic or Embolic (~85%)
  Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis / Renal Failure

Prehospital Stroke Screen

Consistent with Acute Stroke

YES → **Time of Onset Or Time Last Seen Normal < 12 Hours**

YES → **Transport based on:**
STROKE
EMS Triage and Destination Plan
Keep Scene Time to ≤ 10 Minutes
Immediate Notification of Facility

NO → Exit to Appropriate Protocol(s) ***as indicated***

NO →

- Blood Glucose Analysis Procedure
- Altered Mental Status Protocol UP 4 ***if indicated***
- Reperfusion Checklist Procedure
- **B** 12 Lead ECG Procedure
- **A** IV / IO Procedure Preferably 2 Sites
- **A** Venous Access Blood Draw Procedure ***if applicable***
- **P** Cardiac Monitor
- Age Appropriate Cardiac Protocol(s) ***if indicated***
- Head Trauma Protocol TB 5 / Multiple Trauma Protocol TB 6 ***if indicated***
- Seizure Protocol UP 13 ***if indicated***

SBP ≥ 220
DBP ≥ 120
after 3 readings
at least 5 minutes apart

YES → Contact Receiving Facility Concerning Treatment of Hypertension

Notify Destination or Contact Medical Control

Universal Protocol Section

Suspected Stroke

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Stroke Care Toolkit.**
- **Acute Stroke care is evolving rapidly. Time of onset / last seen normal may be changed at any time depending on the capabilities and resources of your hospital based on Stroke: EMS Triage and Destination Plan.**
- **Time of Onset or Last Seen Normal:**
  - **One of the most important items the pre-hospital provider can obtain, of which all treatment decisions are based.**
  - **Be very precise in gathering data to establish the time of onset and report as an actual time (i.e. 13:47 NOT "about 45 minutes ago.")**
  - **Without this information patient may not be able to receive thrombolytics at facility.**
  - **Wake up stroke: Time starts when patient last awake or symptom free.**
- **You are often in the best position to determine the actual Time of Onset while you have family, friends or caretakers available. Often these sources of information may arrive well after you have delivered the patient to the hospital. Delays in decisions due to lack of information may prevent an eligible patient from receiving thrombolytics.**
- **The Reperfusion Checklist should be completed for any suspected stroke patient. With a duration of symptoms of less than** 12 **, scene times should be limited to ≤ 10 minutes, early notification / activation of receiving facility should be performed and transport times should be minimized.**
- **If possible place 2 IV sites.**
- **Blood Draw:**
  - **Many systems utilize EMS venous blood samples. Follow your local policy and procedures.**
- The differential listed on the Altered Mental Status Protocol should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration).
- Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.
- Document the Stroke Screen results in the PCR.
- Agencies may use validated pre-hospital stroke screen of choice.
- **Pediatrics:**
  - Strokes do occur in children, they are slightly more common in ages < 2, in boys, and in African-Americans. Newborn and infant symptoms consist of seizures, extreme sleepiness, and using only one side of the body. Children and teenagers symptoms may consist of severe headaches, vomiting, sleepiness, dizziness, and/or loss of balance or coordination.

Suspected Sepsis

History
- Duration and severity of fever
- Past medical history
- Medications / Recent antibiotics
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Indwelling medical device
- Last acetaminophen or ibuprofen
- Recent Hospital / healthcare facility
- Bedridden or immobile
- Elderly and very young – at risk
- Prosthetic device / indwelling device

Signs and Symptoms
- Warm
- Flushed
- Sweaty
- Chills / Rigors
- Delayed cap refill
- Mental status changes

Associated Symptoms (Helpful to localize source)
- myalgias, cough, chest pain, headache, dysuria, abdominal pain, rash

Differential
- Infections: UTI, Pneumonia, skin/ wound
- Cancer / Tumors / Lymphomas
- Medication or drug reaction
- Connective tissue disease: Arthritis, Vasculitis
- Hyperthyroidism
- Heat Stroke
- Meningitis
- Hypoglycemia/hypothermia
- MI / CVA

Consider: Contact, Droplet, and Airborne Precautions

Temperature Measurement Procedure ***if available***

Fever / Infection Control Protocol UP 10 ***if needed***

Altered Mental Status Protocol UP 4 ***if needed***

B 12 Lead ECG Procedure

A IV / IO Procedure ***If indicated***

P Cardiac Monitor

Sepsis Screen Positive

NO → Exit to Age Appropriate Condition Appropriate Protocol(s)

YES → **SEPSIS ALERT**
Notify Receiving Facility Immediately

Adult SIRS Criteria
Temperature
≥ 100.4° F (38° C)
Or
≤ 96.8° F (36° C)
AND
Any 1 of the following:
HR > 90
RR > 20
EtCO < 25 mmHg

Adult qSOFA Criteria
SBP ≤ 100 mmHG
RR ≥ 22
AMS or new mental status change

Pediatrics SIRS Criteria
Temperature
Same as adult

AND
Heart Rate
1 month – 1 year > 180
2 – 5 years > 140
6 – 12 years > 130
13 – 18 years > 120

MAP
(Mean Arterial Pressure)

$$\frac{SBP + 2(DBP)}{3}$$

Monitor usually calculates this value on screen

A
- Venous Access Blood Draw ***if applicable***
- **Normal Saline 500 mL Bolus**
  Repeat as needed
  Titrate SPB ≥ 90 mmHg
  MAP > 65 mmHg
  Maximum 2 L

  Peds: 20 mL/kg IV / IO
  Repeat to titrate
  Age Appropriate
  SBP ≥ 70 + 2 x Age
  Maximum 60 mL/kg

P **This Space Left Blank Intentionally**

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3

Notify Destination or Contact Medical Control

Universal Protocol Section

Suspected Sepsis

Abdominal pain is not a typical presentation of sepsis, but some patients do have nausea and vomiting.

Septic shock is the result of a massive systemic inflammatory response to infection by gram-negative or gram-positive aerobes, anaerobes, fungi, or viruses. Gram-negative organisms appear to be the primary cause of sepsis, especially hospitalized patients. More patients are remaining at home and have medical devices inserted, making the patients prone to infection. Many of these patients have compromised immune systems, putting them at even greater risk for sepsis.

The basis of septic shock and systemic inflammatory response syndrome (SIRS) is a complex process of inflammatory response and multisystem organ failure. Two or more of the following criteria must be met for a diagnosis of SIRS:
- Temp. >100F (38C) or <97F (36C)
- Pulse rate > 90 beats/min
- Resp. rate >20 bpm or PaCO2 <32 mmHg
- WBC >12,000/mm3, <4,000/mm3, or >10% band neutrophilia

The Robson Prehospital Severe Sepsis Screening tool has a 75% success rate in identifying sepsis. It is key that prehospital providers relay the potential for sepsis to hospital personnel.
- Temp. >100.9F (38.3C) or <96.8F (36.0C)
- Pulse rate > 90 bpm
- Resp. rate > 20 bpm
- Acutely altered mental status
- FSBS > 119 mg/dL – unless diabetic

If these findings are present in a patient with a history that is suggestive of infection, sepsis should be considered.

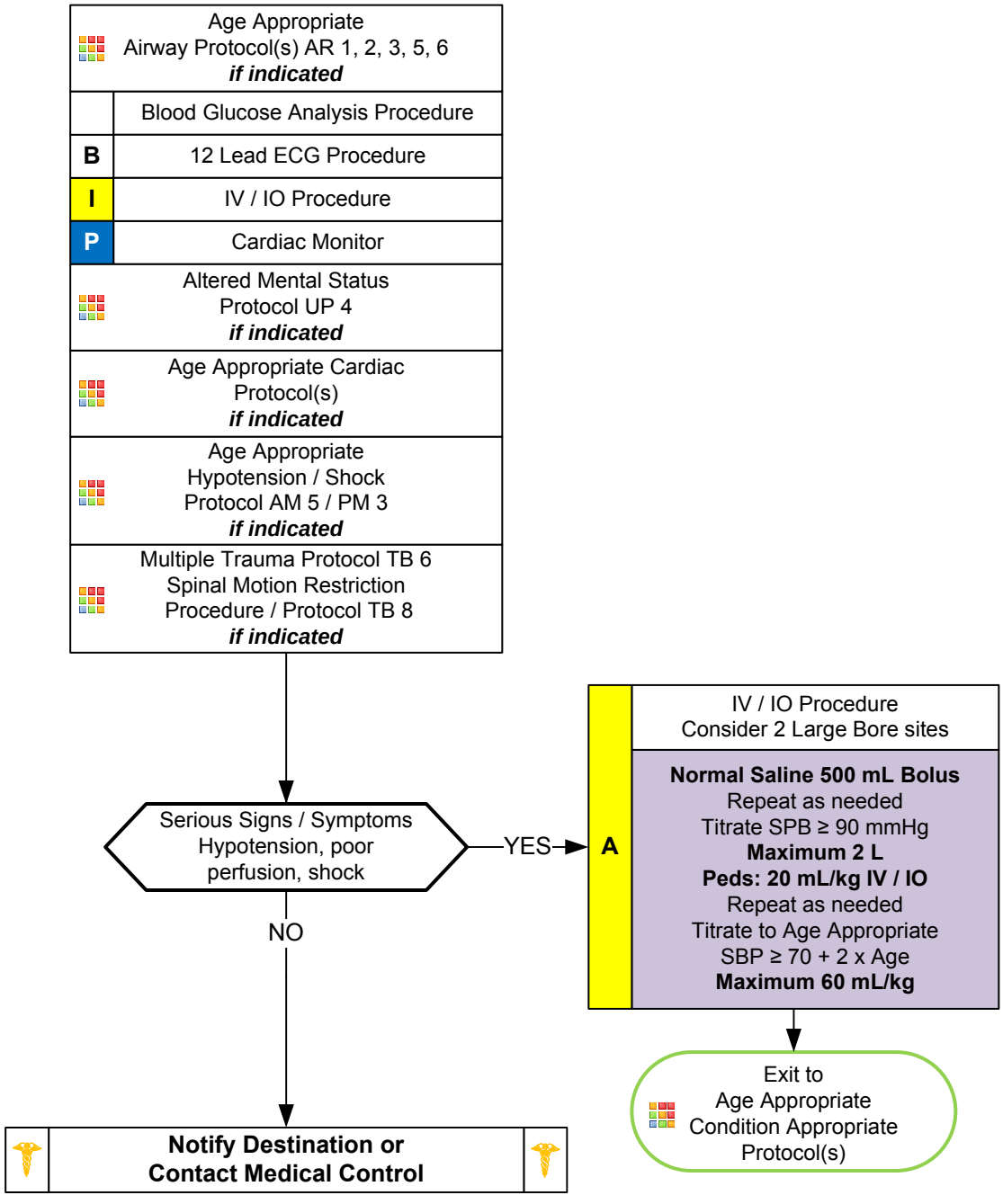
- **Pearls**
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Recommended Exam Pediatrics: In childhood, physical assessment reveals important clues for sepsis. Look for mental status abnormalities such as anxiety, restlessness, agitation, irritability, confusion, or lethargy. Cardiovascular findings to look for include cool extremities, capillary refill >3 seconds, or mottled skin.**
- **Sepsis is a life threatening condition where the body's immune response to infection injures its own tissues and organs.**
- **Severe sepsis is a suspected infection and 2 or more SIRS criteria (or qSOFA) with organ dysfunction such as AMS or hypotension.**
- **Septic shock is severe sepsis and poor perfusion unimproved after fluid bolus.**
- **Agencies administering antibiotics should inquire about drug allergies specific to antibiotics or family of antibiotics.**
- **Following each fluid bolus, assess for pulmonary edema. Consider administration of agency specific vasopressor.**
- **Supplemental oxygen should be given and titrated to oxygenation saturation ≥ 94%.**
- **EKG should be obtained with suspected sepsis, but should not delay care in order to obtain.**
- **Abnormally low temperatures increase mortality and found often in geriatric patients.**
- Quantitative waveform capnography can be a reliable surrogate for lactate monitoring in detecting metabolic distress in sepsis patients. $EtCO_2$ < 25 mm Hg are associated with serum lactate levels > 4 mmol/L.
- Patients with a history of liver failure should not receive acetaminophen.
- **Droplet precautions:**
  - Include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient.
  - This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected.
  - A patient with a potentially infectious rash should be treated with droplet precautions.
- **Airborne precautions:**
  - Include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions.
  - This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.
- **All-hazards precautions:**
  - Include standard PPE plus airborne precautions plus contact precautions.
  - This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS).
- Allergies to NSAIDs (non-steroidal anti-inflammatory medications) are a contraindication to Ibuprofen.
- Agency Medical Director may require contact of medical control prior to EMT / MR administering any medication.
- **Sepsis Screen:**
  - Agencies may use Adult / Pediatric Systemic Inflammatory Response Syndrome (SIRS) criteria or quickSOFA (qSOFA) criteria.
  - Robson Prehospital Severe Sepsis Screening Tool
  - Receiving facility should be involved in determining Sepsis Screen utilized by EMS.

Syncope

History
- Cardiac history, stroke, seizure
- Occult blood loss (GI, ectopic)
- Females: LMP, vaginal bleeding
- Fluid loss: nausea, vomiting, diarrhea
- Past medical history
- Medications

Signs and Symptoms
- Loss of consciousness with recovery
- Lightheadedness, dizziness
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Decreased blood pressure

Differential
- Vasovagal
- Orthostatic hypotension
- Cardiac syncope
- Micturition / Defecation syncope
- Psychiatric
- Stroke
- Hypoglycemia
- Seizure
- Shock (see Shock Protocol)
- Toxicological (Alcohol)
- Medication effect (hypertension)
- PE
- AAA



Universal Protocol Section

Syncope

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Syncope is both loss of consciousness and loss of postural tone. Symptoms preceding the event are important in determining etiology.**
- **Syncope often is due to a benign process but can be an indication of serious underlying disease in both the adult and pediatric patient.**
- **Often patients with syncope are found normal on EMS evaluation. In general patients experiencing syncope require cardiac monitoring and emergency department evaluation.**
- **Differential should remain wide and include:**

Cardiac arrhythmia	Neurological problem	Choking	Pulmonary embolism
Hemorrhage	Stroke	Respiratory	Hypo or Hyperglycemia
GI Hemorrhage	Seizure	Sepsis	

- **High-risk patients:**

Age ≥ 60	Syncope with exertion
History of CHF	Syncope with chest pain
Abnormal ECG	Syncope with dyspnea

- **Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age) mmHg and 11 years and older > 90 mmHg.**
- **Abdominal / back pain in women of childbearing age should be treated as pregnancy related until proven otherwise.**
- **The diagnosis of abdominal aneurysm should be considered with abdominal pain, with or without back and / or lower extremity pain or diminished pulses, especially in patients over 50 and / or patients with shock/ poor perfusion. Notify receiving facility early with suspected abdominal aneurysm.**
- **Consider cardiac etiology in patients > 50, diabetics and / or women especially with upper abdominal complaints.**
- **Heart Rate: One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.**
- Syncope with no preceding symptoms or event may be associated with arrhythmia.
- Assess for signs and symptoms of trauma if associated or questionable fall with syncope.
- Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope.
- These patients should be transported. Patients who experience syncope associated with headache, neck pain, chest pain, abdominal pain, back pain, dyspnea, or dyspnea on exertion need prompt medical evaluation.
- More than 25% of geriatric syncope is cardiac dysrhythmia based.

Adult Asystole / Pulseless Electrical Activity

History
- SAMPLE
- Estimated downtime
- See Reversible Causes below
- DNR, MOST, or Living Will

Signs and Symptoms
- Pulseless
- Apneic
- No electrical activity on ECG
- No heart tones on auscultation

Differential
- See Reversible Causes below

Cardiac Arrest Protocol AC 3

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES

Decomposition
Rigor mortis
Dependent lividity
Blunt force trauma
Injury incompatible with life
Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

Begin Continuous CPR Compressions
Push Hard (≥ 2 inches)
Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(sooner if fatigued)
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 seconds
30:2 Compression:Ventilation if no Advanced Airway
Monitor EtCO2
if available

AED Procedure
if available

Search for Reversible Causes

P Consider Chest Decompression Procedure

P Cardiac Monitor

A IV / IO Procedure

Epinephrine (1:10,000) 1 mg IV / IO
Repeat every 3 to 5 minutes

Normal Saline Bolus 500 mL IV / IO
May repeat as needed
Maximum 2 L

Adult Rhythm Appropriate Protocol(s)
as indicated

P

Available for Agency Medications

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On Scene Resuscitation / Termination of Resuscitation Protocol(s) AC 12
as indicated

Notify Destination or Contact Medical Control

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 9

Adult Cardiac Protocol Section

Adult Asystole / Pulseless Electrical Activity

Pearls

- **Team Focused Approach / Pit-Crew Approach recommended; assigning responders to predetermined tasks. Refer to optional protocol or development of local agency protocol.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT), compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- Reassess and document BIAD and / or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation**.
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO2 (EtCO2)**

  If EtCO2 is < 10 mmHg, improve chest compressions.
  If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**

  Maternal Arrest - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.

  Renal Dialysis / Renal Failure - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.

  Opioid Overdose - Naloxone 2 mg IM / IV / IO / IN. EMT may administer Naloxone via IN route only. May give from EMS supply.

  Drowning / Suffocation / Asphyxiation / Hanging / Lightening Strike – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:**

  Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Bradycardia; Pulse Present

History
- Past medical history
- Medications
  - Beta-Blockers
  - Calcium channel blockers
  - Clonidine
  - Digoxin
- Pacemaker

Signs and Symptoms
- HR < 60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or Shock
- Altered mental status
- Syncope

Differential
- Acute myocardial infarction
- Hypoxia / Hypothermia
- Pacemaker failure
- Sinus bradycardia
- Head injury (elevated ICP) or Stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (1°, 2°, or 3°)
- Overdose

Heart Rate < 60 / min and Symptomatic:
Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to bradycardia
Typically HR < 50 / min

NO → Exit to Appropriate Protocol(s)

YES

Airway Protocol(s) AR 1, 2, 3 ***if indicated***

Respiratory Distress Protocol AR 4 ***if indicated***

Chest Pain: Cardiac and STEMI Protocol AC 4 ***if indicated***

B Search for Reversible Causes

B 12 Lead ECG Procedure

A IV / IO Procedure

P Cardiac Monitor

A **Normal Saline Fluid Bolus**
500 mL – 2 L NS IV / IO
(Unless Acute CHF)
Maximum 2 L

P **Atropine 0.5 mg IV / IO**
May repeat every 3 – 5 minutes
Maximum 3 mg

P **Epinephrine 1 - 10 mcg/min IV / IO**
Titrate to SBP ≥ 90 mmHg
Or
Dopamine 2 – 20 mcg/kg/min IV / IO
Titrate to SBP ≥ 90 mmHg

P **This area intentionally left blank**

P **If No Improvement**
Transcutaneous Pacing Procedure
(Consider earlier in 2nd or 3rd AVB)

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

P

Consider Sedation

Midazolam 2 – 2.5 mg
IV / IO / IM / IN

Maximum 10 mg

Consider Pain Control

Fentanyl
75-150mcg

Maximum 500mcg

Notify Destination or Contact Medical Control

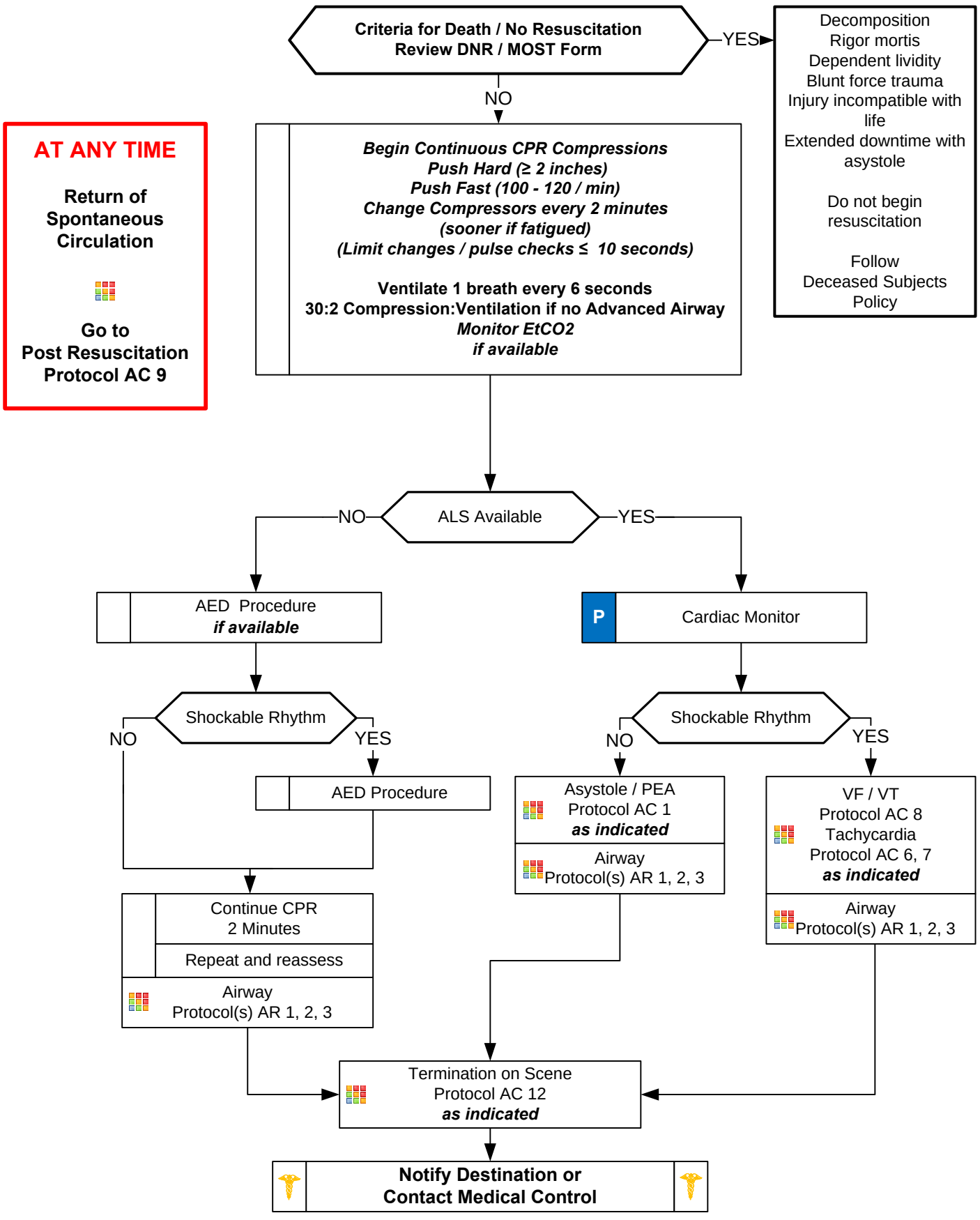
Adult Cardiac Protocol Section

Bradycardia; Pulse Present

Pearls

- **Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro**
- **Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.**
- **Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess.**
- **Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia.**
- **Hypoxemia is a common cause of bradycardia. Ensure oxygenation and support respiratory effort.**
- **<u>Atropine</u>**
  - **Do NOT delay Transcutaneous Pacing to administer Atropine in bradycardia with poor perfusion.**
  - **Caution in setting of acute MI. Elevated heart rate can worsen ischemia.**
  - **Ineffective and potentially harmful in cardiac transplantation. May cause paradoxical bradycardia.**
- **<u>Transcutaneous Pacing Procedure (TCP)</u>**
  - **Utilize TCP early if no response to atropine. If time allows transport to specialty center because transcutaneous pacing is a temporizing measure. Transvenous / permanent pacemaker will probably be needed.**
  - **Immediate TCP with high-degree AV block (2d or 3d degree) with no IV / IO access.**
- Consider treatable causes for bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, etc.)

Cardiac Arrest; Adult



Adult Cardiac Protocol Section

Cardiac Arrest; Adult

Pearls

- **Team Focused Approach / Pit-Crew Approach recommended; assign responders to predetermined tasks. Refer to optional protocol or development of local agency protocol.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- Reassess and document BIAD and / or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation**.
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO2 (EtCO2)**
  If EtCO2 is < 10 mmHg, improve chest compressions.
  If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  Maternal Arrest - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  Renal Dialysis / Renal Failure - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  Opioid Overdose - Naloxone cannot be recommended in opioid-associated cardiac arrest. If suspected, attention to airway, oxygenation, and ventilation increase in importance. Naloxone is not associated with improved outcomes in cardiac arrest.
  Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:**
  Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Chest Pain: Cardiac and STEMI

History
- Age
- Medications (Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies
- Recent physical exertion
- **P**alliation / **P**rovocation
- **Q**uality (crampy, constant, sharp, dull, etc.)
- **R**egion / **R**adiation / **R**eferred
- **S**everity (1-10)
- **T**ime (onset /duration / repetition)

Signs and Symptoms
- CP (pain, pressure, aching, vice-like tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness
- **Time of Onset**
- Women:
  More likely to have dyspnea, N/V, weakness, back or jaw pain

Differential
- Trauma vs. Medical
- Angina vs. Myocardial infarction
- Pericarditis
- Pulmonary embolism
- Asthma / COPD
- Pneumothorax
- Aortic dissection or aneurysm
- GE reflux or Hiatal hernia
- Esophageal spasm
- Chest wall injury or pain
- Pleural pain
- Overdose: Cocaine or Methamphetamine

B	**12 Lead ECG Procedure**
	Aspirin 81 mg x 4 PO (chewed) Or **325 mg PO**
	Nitroglycerin 0.3 / 0.4 mg Sublingual Repeat every 5 minutes x 3 ***if prescribed to patient and (BP ≥ 100)***
P	Cardiac Monitor

Acute MI / STEMI
(STEMI = 1 mm ST Segment Elevation ≥ 2 Contiguous Leads)

YES →

Transport based on:
STEMI
EMS Triage and Destination Plan
Immediate Notification of Facility
Immediate Transmission of ECG
if capable
Keep Scene Time to ≤ 10 Minutes

B	*If transporting to Non PCI Center* **Reperfusion Checklist**
P	Agency Specific Medications Thrombolytic Heparin Plavix

NO ↓

A	IV / IO / Blood Draw Procedure
A	**Nitroglycerin 0.3 / 0.4 mg SL** Repeat every 5 minutes as needed
A	**Nitroglycerin Paste**
P	**Morphine 2 – 4 mg IV / IO** Repeat every 5 minutes as needed **Maximum 10 mg** **Or** **Fentanyl 50 – 75 mcg IV / IO** Repeat 25 mcg every 20 minutes as needed **Maximum 200 mcg**
	Hypotension / Shock Protocol AM 5 ***if indicated***
	CHF / Pulmonary Edema Protocol AC 5 ***if indicated***

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Chest Pain: Cardiac and STEMI

Patients who are abusing cocaine will show signs of agitation and have dilated pupils. First-line treatment for cocaine-induced arrhythmias and hypertensive episodes is usually benzodiazepine administration, which tempers the effects of cocaine on the central nervous system and cardiovascular system. Ativan 1-2mg may be administered. If any question, contact Medical Control.

When encountering Non-ST change chest pain that is potentially Acute Coronary Syndrome (ACS) related you should consider the HEART Score for risk stratification. While troponin may not be immediately available in the field, the other score portions can show high/low risk for the patient that can be relayed to the receiving facility. This can be used in patients ≥ 21 years old presenting with symptoms suggestive of ACS. Do not use if new ST-segment elevation ≥ 1mm or other new ECG changes, hypotension, life expectancy less than 1 year, or non-cardiac medical/surgical/psychiatric illness determined.

- H – History
  - Slightly Suspicious = 0
  - Moderately suspicious = +1
  - Highly suspicious = +2
- E – ECG – 1 point: No ST depression but LBBB, LVH, repolarization changes (ex. Digoxin);
  - 2 points: ST depression / elevation not due to LBBB, LVH, or digoxin
  - Normal = 0
  - Non-specific repolarization disturbance = +1
  - Significant ST depression = +2
- A – Age
  - < 45 = 0
  - 45-64 = +1
  - ≥ 65 = +2
- R – Risk Factors: HTN, hypercholesterolemia, DM, obesity (BMI >30), smoking (current or cessation less than 3 months), positive family history (parent or sibling with CVD before age 65); atherosclerotic disease; prior MI, PCI/CABG, CVA/TIA, or peripheral arterial disease
  - No known risk factors = 0
  - 1-2 risk factors = +1
  - ≥ 3 risk factors or history of atherosclerotic disease = +2
- T – Initial Troponin: Use local assays and corresponding cutoffs
  - ≤ normal limit = 0
  - 1-2x normal limit = +1
  - > 2x normal limit = +2

Scores 0-3: 0.9-1.7% risk of adverse cardiac event.
Scores 4-6: 12-16.6% risk of adverse cardiac event.
Scores > 7: 50-65% risk of adverse cardiac event – may be candidates for early invasive measures.

Obtain serial 12 leads after medication administration to follow the potential evolution/changes with the ECG.

Notify the receiving facility of the STEMI – Speak with physician during encode to activate the cath-lab.

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are the key performance indicators for the EMS Acute Cardiac (STEMI) Care Toolkit**
- **Use caution when administering Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.**
- **STEMI (ST-Elevation Myocardial Infarction)**
  - **Positive Reperfusion Checklist should be transported to the appropriate facility based on STEMI EMS Triage and Destination Plan.**
  - **Consider placing 2 IV sites in the left arm: Many PTCI centers use the right radial vein for intervention.**
  - **Consider placing defibrillator pads on patient as a precaution.**
  - **Consider Normal Saline or Lactated Ringers bolus of 250 – 500 mL as pre-cath hydration.**
- **If CHF / Cardiogenic shock resulting from inferior MI (II, III, aVF), consider Right Sided ECG (V3 or V4). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring normal saline boluses.**
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Monitor for hypotension after administration of nitroglycerin and narcotics (Morphine, Fentanyl, or Dilaudid).
- Diabetic, geriatric and female patients often have atypical pain, or only generalized complaints.
- Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (Paramedic).
- **EMT may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply.**
- Agency medical director may require Contact of Medical Control prior to administration.

CHF / Pulmonary Edema

History
- Congestive heart failure
- Past medical history
- Medications (digoxin, Lasix, Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Cardiac history --past myocardial infarction

Signs and Symptoms
- Respiratory distress, bilateral rales
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

Differential
- Myocardial infarction
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure

Airway
Protocol(s) AR 1, 2, 3
as indicated

Chest Pain and STEMI
Protocol AC 4
if indicated

B — 12 Lead ECG Procedure

B — **Nitroglycerin 0.3 / 0.4 mg Sublingual**
Repeat every 5 minutes x 3
if prescribed to patient and (BP >100)

P — Cardiac Monitor

A — IV / IO Procedure

Assess Symptom Severity

MILD
Normal Heart Rate
Elevated or Normal BP

A — **Nitroglycerin 0.3 / 0.4 mg SL**
Repeat every 5 minutes
Nitroglycerin Paste

Improving — NO → (B) **Airway CPAP Procedure**

YES

MODERATE / SEVERE
Elevated Heart Rate
Elevated BP

B — **Airway CPAP Procedure**

A — **Nitroglycerin 0.3 / 0.4 mg SL**
Repeat every 5 minutes
Nitroglycerin Paste

P — **ACE-Inhibitor**

P — Consider **Furosemide 40 mg IV**
ONLY IF
Transport time > 30 minutes
Known CHF / Daily Lasix
Afebrile

CARDIOGENIC SHOCK
Tachycardia followed by bradycardia
Hypertension followed by hypotension

B — Remove CPAP
if in place

Adult Hypotension / Shock
Protocol AM 5
if indicated

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

CHF / Pulmonary Edema

Management of heart failure is geared toward improving gas exchange and cardiac output. If the actual blood pressure is adequate (systolic blood pressure > 100 mm/Hg), help the patient get into a comfortable position. Many times this can be done with the patient sitting with legs dependent. Oxygen saturations above 90% are desired, so you should evaluate the patient for possible ventilatory assistance. If there are signs of respiratory failure along with altered mental status, intubation and invasive pulmonary ventilation will be necessary. If the patient is alert enough, noninvasive positive pressure ventilation (NIPPV) can be therapeutic in two ways: (1) decreasing venous return and preload, thereby reducing pulmonary edema, and (2) improving gas exchange.

Along with positive pressure ventilation, if the systolic blood pressure is above 100 mm/Hg, nitroglycerin has emerged as the primary treatment of pulmonary edema. Nitroglycerin acts to decrease preload through peripheral vasodilation. Caution must be exercised when employing nitroglycerin and positive pressure ventilation simultaneously; systemic blood pressure can drop quickly. Patients with subacute CHF who also feel volume overloaded may be given furosemide to initiate diuresis. Furosemide should also be used with caution because many patients with "crackles" on exam are later found to have pneumonia. Diuresis in this group of patients can be detrimental. In addition, many of those who do have CHF are not total-body-fluid overloaded; the fluid is just not distributed correctly. Diuresis can be detrimental in these patients because many have poor renal function to begin with.

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Furosemide and Opioids have NOT been shown to improve the outcomes of EMS patients with pulmonary edema. Even though this historically has been a mainstay of EMS treatment, it is no longer routinely recommended.**
- **Use CAUTION when administering Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.**
- **Carefully monitor the level of consciousness, BP, and respiratory status with the above interventions.**
- **If CHF / Cardiogenic shock resulting from inferior MI (II, III, aVF), consider Right Sided ECG (V3 or V4). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring normal saline boluses.**
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Contraindications to opioids include severe COPD and respiratory distress. Monitor the patient closely.
- Consider myocardial infarction in all these patients. Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints.
- Allow the patient to be in their position of comfort to maximize their breathing effort.
- Document CPAP application using the CPAP procedure in the PCR. Document 12 Lead ECG using the 12 Lead ECG procedure.
- **EMT may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply**.
- Agency medical director may require Contact of Medical Control.

Adult Tachycardia
Narrow Complex (≤ 0.11 sec) REGULAR RHYTHM

Unstable / Serious Signs and Symptoms
HR Typically > 150
Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES →

P — Cardioversion Procedure

Narrow and Regular: 50 – 100J

Narrow and Irregular: 120 – 200J

May repeat and increase dose with subsequent cardioversion attempts

Consider Sedation Prior to Cardioversion

Midazolam 2 – 2.5 mg IV / IO
May repeat as needed
Maximum 10 mg

Exit to Appropriate Protocol(s)
if rhythm converts

NO ↓

B — 12 Lead ECG Procedure

A — IV / IO Procedure

P — Cardiac Monitor

Attempt Vagal Maneuvers Procedure

Adenosine 6 mg IV / IO
Rapid push with flush
May repeat **12 mg IV / IO**
May repeat **12 mg IV / IO**

Amiodarone 150 mg in 100 mL of D5W IV / IO
Infuse over 10 minutes
May repeat if wide complex tachycardia recurs

Amiodarone 450 mg in 250 mL of D5W
1 mg/min (33 mL/hr)

Or
Diltiazem 0.25 mg/kg IV / IO
Over 2 – 3 minutes
Maximum 25 mg

<u>If No Improvement</u>
Diltiazem 5 – 15 mg/hr IV / IO

<u>If No Improvement in 15 minutes</u>
Diltiazem 0.35 mg/kg IV / IO
Maximum 25 mg

Single lead ECG able to diagnose and treat arrhythmia

12 Lead ECG not necessary to diagnose and treat, but preferred when patient is stable.

RHYTHM CONVERTS

YES → B — 12 Lead ECG Procedure; Monitor and Reassess

NO ↓

Monitor and Reassess

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Adult Tachycardia
Narrow Complex (≤ 0.11 sec) IRREGULAR RHYTHM

Unstable / Serious Signs and Symptoms
HR Typically > 150
Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES →

P — Cardioversion Procedure

Narrow and Regular: 50 – 100J

Narrow and Irregular: 120 – 200J

May repeat and increase dose with subsequent cardioversion attempts

Consider Sedation Prior to Cardioversion

Midazolam 2 – 2.5 mg IV / IO
May repeat as needed
Maximum 10 mg

Exit to Appropriate Protocol(s) ***if rhythm converts***

NO ↓

B — 12 Lead ECG Procedure

A — IV / IO Procedure

Cardiac Monitor

Attempt Vagal Maneuvers Procedure

P

Diltiazem 0.25 mg/kg IV / IO
Over 2 – 3 minutes
Maximum 25 mg

If No Improvement
Diltiazem 5 – 15 mg/hr IV / IO

If No Improvement in 15 minutes
Diltiazem 0.35 mg/kg IV / IO
Maximum 25 mg

Single lead ECG able to diagnose and treat arrhythmia

12 Lead ECG not necessary to diagnose and treat, but preferred when patient is stable.

RHYTHM CONVERTS

YES → B — 12 Lead ECG Procedure; Monitor and Reassess

NO ↓

Monitor and Reassess

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Adult Tachycardia
Narrow Complex (≤ 0.11 sec)

If treating with Diltiazem/Cardiazem for irregular rhythm and the patient is concious and borderline hypotension, consider treatment with calcium chloride prior to administration of Diltiazem / Cardiazem.

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE and SYMPTOMATIC.**
- **Rhythm should be interpreted in the context of symptoms.**
- **Unstable condition**
  Condition which acutely impairs vital organ function and cardiac arrest may be imminent.
  If at any point patient becomes unstable move to unstable arm in algorithm.
- **Symptomatic condition**
  Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.
  Symptomatic tachycardia usually occurs at rates ≥ 150 beats per minute. Patients symptomatic with heart rates < 150 likely have impaired cardiac function such as CHF.
- **Serious Signs / Symptoms:**
  Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute CHF.
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g. Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- Typical sinus tachycardia is in the range of 100 to (200 - patient's age) beats per minute.
- **Regular Narrow-Complex Tachycardias:**
  Vagal maneuvers and adenosine are preferred. Vagal maneuvers may convert up to 25 % of SVT.
  Adenosine should be pushed rapidly via proximal IV site followed by 20 mL Normal Saline rapid flush.
  Agencies using both calcium channel blockers and beta blockers should choose one primarily. Giving the agents sequentially requires **Contact of Medical Contro**l. This may lead to profound bradycardia / hypotension.
- **Irregular Tachycardias:**
  First line agents for rate control are calcium channel blockers or beta blockers.
  Agencies using both calcium channel blockers and beta blockers should choose one primarily. Giving the agents sequentially requires **Contact of Medical Control**. This may lead to profound bradycardia / hypotension.
  Adenosine may not be effective in identifiable atrial fibrillation / flutter, yet is not harmful and may help identify rhythm.
  Amiodarone may be given in CHF, risk of rhythm conversion in patients with arrhythmia > 48 hours.
- **Synchronized Cardioversion:**
  Recommended to treat UNSTABLE Atrial Fibrillation, Atrial Flutter and Monomorphic-Regular Tachycardia (VT.)
- Monitor for hypotension after administration of Calcium Channel Blockers or Beta Blockers.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Adult Tachycardia

Wide Complex (≥0.12 sec) REGULAR RHYTHM

Unstable / Serious Signs and Symptoms
HR Typically > 150
Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES →

P	Cardioversion Procedure
	Wide and Regular: 100J
	Wide and Irregular: 200 – 360J (Not Synchronized)
	May repeat and increase dose with subsequent cardioversion attempts
	Consider Sedation Prior to Cardioversion
	Midazolam 2 – 2.5 mg IV / IO May repeat as needed **Maximum 10 mg**

NO ↓

B	12 Lead ECG Procedure
A	IV / IO Procedure
P	Cardiac Monitor

↓

REGULAR RHYTHM and Monomorphic QRS Complex

NO → (skips to Consider consultation with medical control if patient is stable)

YES ↓

P	**Adenosine 6 mg IV / IO** Rapid push with flush May repeat **12 mg IV / IO** May repeat **12 mg IV / IO**
	Amiodarone 150 mg in 100 mL of D5W IV / IO Infuse over 10 minutes
	May repeat if wide complex tachycardia recurs
	Amiodarone 450 mg in 250 mL of D5W 1 mg/min (33 mL/hr) IV / IO
	Or **Lidocaine 1 mg / kg IV / IO. If infusion is initiated > 15 minutes from first bolus, repeat 1 mg / kg bolus**

↓

P	**Consider consultation with medical control if patient is stable**

↓

RHYTHM CONVERTS

YES →

B	12 Lead ECG Procedure
	Monitor and Reassess

NO ↓

	Monitor and Reassess

↓

Notify Destination or Contact Medical Control

Single lead ECG able to diagnose and treat arrhythmia

12 Lead ECG not necessary to diagnose and treat, but preferred when patient is stable.

Adult Cardiac Protocol Section

Adult Tachycardia

Wide Complex (≥0.12 sec) IRREGULAR RHYTHM

Unstable / Serious Signs and Symptoms
HR Typically > 150
Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES →

P	Cardioversion Procedure
	Wide and Regular: 100J
	Wide and Irregular: 200 – 360J (Not Synchronized)
	May repeat and increase dose with subsequent cardioversion attempts
	Consider Sedation Prior to Cardioversion
	Midazolam 2 – 2.5 mg IV / IO May repeat as needed **Maximum 10 mg**

NO ↓

B	12 Lead ECG Procedure
A	IV / IO Procedure
P	Cardiac Monitor

IRREGULAR RHYTHM and MONOMORPHIC QRS Complex

P	
	Amiodarone 150 mg in 100 mL of D5W IV / IO Infuse over 10 minutes
	May repeat if wide complex tachycardia recurs
	Amiodarone 450 mg in 250 mL of D5W 1 mg/min (33 mL/hr) IV / IO
	Or **Lidocaine 1 mg / kg IV / IO. If infusion is initiated > 15 minutes from first bolus, repeat 1 mg / kg bolus**

P	Consider consultation with medical control if patient is stable

RHYTHM CONVERTS

YES →

B	12 Lead ECG Procedure
	Monitor and Reassess

NO ↓

	Monitor and Reassess

IRREGULAR RHYTHM and POLYMORPHIC QRS Complex

	Airway Protocol(s) AR 1, 2, 3 **as indicated**
	Pulseless VF / VT Protocol AC 8 Cardiac Arrest Protocol AC 3 **as indicated**

Single lead ECG able to diagnose and treat arrhythmia

12 Lead ECG not necessary to diagnose and treat, but preferred when patient is stable.

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Adult Tachycardia
Wide Complex (≥0.12 sec)

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE and SYMPTOMATIC.**
- **Rhythm should be interpreted in the context of symptoms**
- **Unstable condition**
- **Condition which acutely impairs vital organ function and cardiac arrest may be imminent.**
- **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Symptomatic condition**
  Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.
  Symptomatic tachycardia usually occurs at rates ≥ 150 beats per minute. Patients symptomatic with heart rates < 150 likely have impaired cardiac function such as CHF.
- **Serious Signs / Symptoms:**
  Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute congestive heart failure.
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- Typical sinus tachycardia is in the range of 100 to (220 – patients age) beats per minute.
- **Regular Wide-Complex Tachycardias:**
  Unstable condition:
  Immediate defibrillation if pulseless and begin CPR.
  Stable condition:
  Typically VT or SVT with aberrancy. Adenosine may be given if regular and monomorphic and if defibrillator available.
  Verapamil contraindicated in wide-complex tachycardias.
  Agencies using Amiodarone, Procainamide and Lidocaine need choose one agent primarily. Giving multiple anti-arrhythmics requires contact of medical control.
  Atrial arrhythmias with WPW should be treated with Amiodarone or Procainamide
- **Irregular Tachycardias:**
  Wide-complex, irregular tachycardia: Do not administer calcium channel, beta blockers, or adenosine as this may cause paradoxical increase in ventricular rate. This will usually require cardioversion. Contact medical control.
- **Polymorphic / Irregular Tachycardia:**
  This situation is usually unstable and immediate defibrillation is warranted.
  When associated with prolonged QT this is likely Torsades de pointes: Give 2 gm of Magnesium Sulfate slow IV / IO.
  Without prolonged QT likely related to ischemia and Magnesium may not be helpful.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Cardiac Arrest Protocol AC 3

Begin Continuous CPR Compressions
Push Hard (≥ 2 inches) Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(*sooner if fatigued*)
(*Limit changes / pulse checks ≤ 10 seconds*)

<u>At the end of each 2 minute cycle</u>
Check AED / ECG Monitor
If shockable rhythm, deliver shock and immediately continue chest compressions

Search for Reversible Causes

A

IV / IO Procedure

Epinephrine (1:10,000) 1 mg IV / IO
Repeat every 3 to 5 minutes

<u>Reversible Causes</u>

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Continue CPR Compressions
Push Hard (≥ 2 inches) Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(*sooner if fatigued*)
(*Limit changes / pulse checks ≤ 10 seconds*)

<u>If Rhythm Refractory</u>
Continue CPR and give Agency specific Anti-arrhythmics and Epinephrine
Continue CPR up to point where you are ready to defibrillate with device charged.
Repeat pattern during resuscitation.

P

Amiodarone 300 mg IV / IO
May repeat if refractory
Amiodarone 150 mg IV / IO

Refractory
Consider Lidocaine 1.0 – 1.5 mg/kg IV / IO
May repeat if refractory
Lidocaine 0.75 mg/kg IV / IO
Maximum 3 mg/kg

Refractory
Magnesium 2 gm IV / IO

Refractory after 5 Defibrillations Attempts
Consider Dual Sequential Defibrillation Procedure
if available

Notify Destination or Contact Medical Control

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 9

Adult Cardiac Protocol Section

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

- **Pearls**
- **Recommended Exam: Mental Status, neuro, heart, and lung**
- **Team Focused Approach / Pit-Crew Approach recommended; assigning responders to predetermined tasks.**
- **Refer to optional protocol or development of local agency protocol.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- Reassess and document BIAD and / or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation**.
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO2 (EtCO2)**
- If EtCO2 is < 10 mmHg, improve chest compressions.
- If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Avoid Procainamide in CHF or prolonged QT.**
- **Magnesium Sulfate is not routinely recommended during cardiac arrest, but may help with Torsades de points, Low Magnesium States (Malnourished / alcoholic), and Suspected Digitalis Toxicity**
- If no IV / IO, with drugs that can be given down ET tube, double dose and then flushed with 5 ml of Normal Saline followed by 5 quick ventilations. IV / IO is the preferred route when available.
- Return of spontaneous circulation: Heart rate should be > 60 when initiating anti-arrhythmic infusions.

Post Resuscitation

Return of Spontaneous Circulation

↓

Repeat Primary Assessment

B	**Optimize Ventilation and Oxygenation** • Maintain SpO2 ≥ 94 % • ETCO2 ideally 35 – 45 mm Hg • Respiratory Rate 10 / minute • Remove Impedance Threshold Device • DO NOT HYPERVENTILATE
	Airway Protocol(s) AR 1, 2, 3, 4 ***as indicated***
B	12 Lead ECG Procedure
A	IV / IO Procedure
P	Cardiac Monitor
	Monitor Vital Signs / Reassess

↓

Chest Pain and STEMI Protocol AC 4 ***if indicated***
Hypotension / Shock Protocol AM 5 ***as indicated***
Appropriate Arrhythmia Protocol(s) AC 2, 6, 7 ***as indicated***
Targeted Temperature Management Protocol AC 10 ***if available***
Post Intubation BIAD Management Protocol AR 8

↓

Notify Destination or Contact Medical Control

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Arrhythmias are common and usually self limiting after ROSC

If Arrhythmia Persists follow Rhythm Appropriate Protocol

Adult Cardiac Protocol Section

Post Resuscitation

The initial objectives of post-cardiac arrest care are to:
- Optimize cardiopulmonary function and vital organ perfusion.
- After resuscitation, transport patient to an appropriate hospital with a comprehensive post-cardiac arrest treatment system of care that includes acute coronary interventions, neurological care, goal-directed critical care, and hypothermia.
- Try to identify and treat the precipitating causes of the arrest and prevent recurrent arrest.

Subsequent objectives of post-cardiac arrest care are to:
- Control body temperature to optimize survival and neurological recovery.
- Identify and treat acute coronary syndromes (ACS)
- Optimize mechanical ventilation to minimize lung injury.
- Reduce the risk of multiorgan injury and support organ function if required.

Titrate oxygen to the lowest level required to achieve an arterial oxygen saturation of 94% - 99%, to avoid potential oxygen toxicity.

Hyperventilation or “overbagging” the patient is common after cardiac arrest and should be avoided because of potential adverse hemodynamic effects. Hyperventilation increases intrathoracic pressure and inversely lowers cardiac output. The decrease in $PaCO_2$ seen with hyperventilation can also potentially decrease cerebral blood flow directly. Ventilation may be started at 10 to 12 breaths per minute and titrated to achieve an $EtCO_2$ of 35 to 40 mmHg.

The goal of immediate post-cardiac arrest care is to optimize systemic perfusion, restore metabolic homeostasis, and support organ system function to increase the likelihood of intact neurological survival. The post-cardiac arrest period is often marked by hemodynamic instability as well as metabolic abnormalities. Support and treatment of acute myocardial dysfunction and acute myocardial ischemia can increase the probability of survival. Interventions to reduce secondary brain injury, such as therapeutic hypothermia, can improve survival and neurological recovery.

- **Pearls**
- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- **Continue to search for potential cause of cardiac arrest during post-resuscitation care.**
- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs. Titrate FiO_2 to maintain SpO_2 of ≥ 94%.**
- **Initial End tidal CO_2 may be elevated immediately post-resuscitation, but will usually normalize. While goal is 35 – 45 mmHg avoid hyperventilation to achieve.**
- Most patients immediately post resuscitation will require ventilatory assistance.
- **Titrate fluid resuscitation and vasopressor administration to maintain SBP of 90 – 100 mmHg or Mean Arterial Pressure (MAP) of 65 – 80 mmHg.**
- **<u>STEMI:</u>**
- **Transport to a primary cardiac catheter facility with evidence of STEMI on 12 Lead ECG.**
- **<u>Targeted Temperature Management:</u>**
- **Maintain core temperature between 32 - 36°C.**
- **Infusion of cold saline is NOT recommended in the prehospital setting.**
- **Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiology / cardiac catheterization, intensive care service, and neurology services.**
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post-resuscitation management may best be planned in consultation with medical control.

Target Temperature Management

History
- Non-traumatic cardiac arrests (drownings and hanging / asphyxiation are permissible in this protocol.)
- All presenting rhythms are permissible in this protocol
- Age 18 or greater

Signs and Symptoms
- Cardiac arrest
- Return of Spontaneous Circulation post-cardiac arrest

Differential
- Continue to address specific differentials associated with the arrhythmia

Return of Spontaneous Circulation ROSC

Criteria for Induced Hypothermia
Initial rectal temperature
≥ 93.2 F (34C)

NO → Exit to Post Resuscitation Protocol AC 9

YES

B	**Advanced Airway (includes BIAD) in place** with EtCO2 > 20 mmHg
	Perform Neurological Assessment
	Expose and apply ice packs to axilla and groin areas
A	IV / IO Procedure
	Hypotension / Shock Protocol AM 5 ***as indicated***
	Agency Specific Cooling Device

Airway Protocol(s) AR 1, 2, 3 ***as indicated*** ← NO

Agencies utilizing cerebral cooling devices are unlikely to see a change in rectal temperature during transport.

Continued temperature assessment not warranted with these devices. Document initial temperature

Reassess Rectal Temperature
Target: 89.6 – 96.8 °F
(Range 32 – 36C)

≤ 89.6° F (32° C) → Stop cooling measures Until temperature increases

Reassess temperature every 10 minutes

Continue Post Resuscitation Care

≥ 89.6° F (32° C) → Continue Cooling

Exit to Post Resuscitation Protocol AC 9

Shivering noted

NO → Exit to Post Resuscitation Protocol AC 9

YES

P

Fentanyl 50 – 75 mcg IV / IO
Repeat every 5 minutes as needed
Maximum 200 mg

Versed 2 – 2.5 mg IV / IO
Repeat every 5 minutes as needed
Maximum 10 mg

Vecuronium 10 mg IV / IO
If shivering uncontrolled following Opioid and Benzodiazepine Administration

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Induced Hypothermia

Pearls

- **Criteria for Targeted Temperature Mangement:**
  Return of spontaneous circulation not related to blunt / penetrating trauma or hemorrhage with ventricular fibrillation / tachycardia and non-shockable arrhythmias.
  Temperature greater than 93.2°F (34° C).
  Advanced airway (including BIAD) in place with no purposeful response to verbal commands.
  Infusion of cold saline is NOT recommended in the prehospital setting.
- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.**
- **Titrate FiO2 to maintain SpO2 of ≥ 94%.**
- **Initial End tidal CO2 may be elevated immediately post-resuscitation, but will usually normalize. While goal is 35 – 45 mmHg avoid hyperventilation to achieve.**
- Most patients immediately post resuscitation will require ventilatory assistance.
- If no advanced airway in place obtained, cooling may only be initiated on order from medical control.
- **Titrate fluid resuscitation and vasopressor administration to maintain SBP of 90 – 100 mmHg or Mean Arterial Pressure (MAP) of 65 – 80 mmHg.**
- **STEMI**
  Transport to a primary cardiac catheter facility with evidence of STEMI on 12 Lead ECG.
- **Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiac catherterization and intensive care service.**
- **Utilization of this protocol mandates transport to facility capable of managing the post-arrest patient and continuation of induced hypothermia therapy.**
- Maintain patient modesty. Undergarments may remain in place during cooling.
- No studies to date demonstrate improved neurological outcomes with prehospital initiated cooling.

Team Focused CPR

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES

Decomposition
Rigor mortis
Dependent lividity
Blunt force trauma
Injury incompatible with life
Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

Begin Continuous CPR Compressions
Push Hard (≥ 2 inches)
Push Fast (100 - 120 / min)
Change Compressors every 2 minutes (sooner if fatigued)
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 seconds
30:2 Compression:Ventilation if no Advanced Airway
Monitor EtCO2 if available

First Arriving BLS / ALS Responder
Initiate Compressions Only CPR
Initiate Defibrillation Automated Procedure
if available
Call for additional resources

Second Arriving BLS / ALS Responder
Assume Compressions or
Initiate Defibrillation Automated / Manual Procedure
Place BIAD
DO NOT Interrupt Compressions
Ventilate at 6 to 8 breaths per minute

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 9

Third Arriving Responder
BLS or ALS

BLS

Establish Team Leader
(Hierarchy)
Fire Department or Squad Officer
EMT
First Arriving Responder

Rotate with Compressor
To prevent Fatigue and effect high quality compressions
Take direction from Team Leader

Fourth / Subsequent Arriving Responders
Take direction from Team Leader

Continue Cardiac Arrest Protocol AC 3

ALS

A

Establish Team Leader
(Hierarchy)
EMS ALS Personnel
Fire Department or Squad Officer
EMT
First Arriving Responder

Initiate Defibrillation Automated Procedure
Establish IV / IO
Administer Appropriate Medications
Establish Airway with BIAD if not in place

P

Initiate Defibrillation Manual Procedure
Continuous Cardiac Monitoring
Establish IV / IO
Administer Appropriate Medications
Establish Airway with BIAD if not in place

Continue Cardiac Arrest Protocol AC 3

Team Leader
ALS Personnel
Responsible for patient care
Responsible for briefing / counseling family

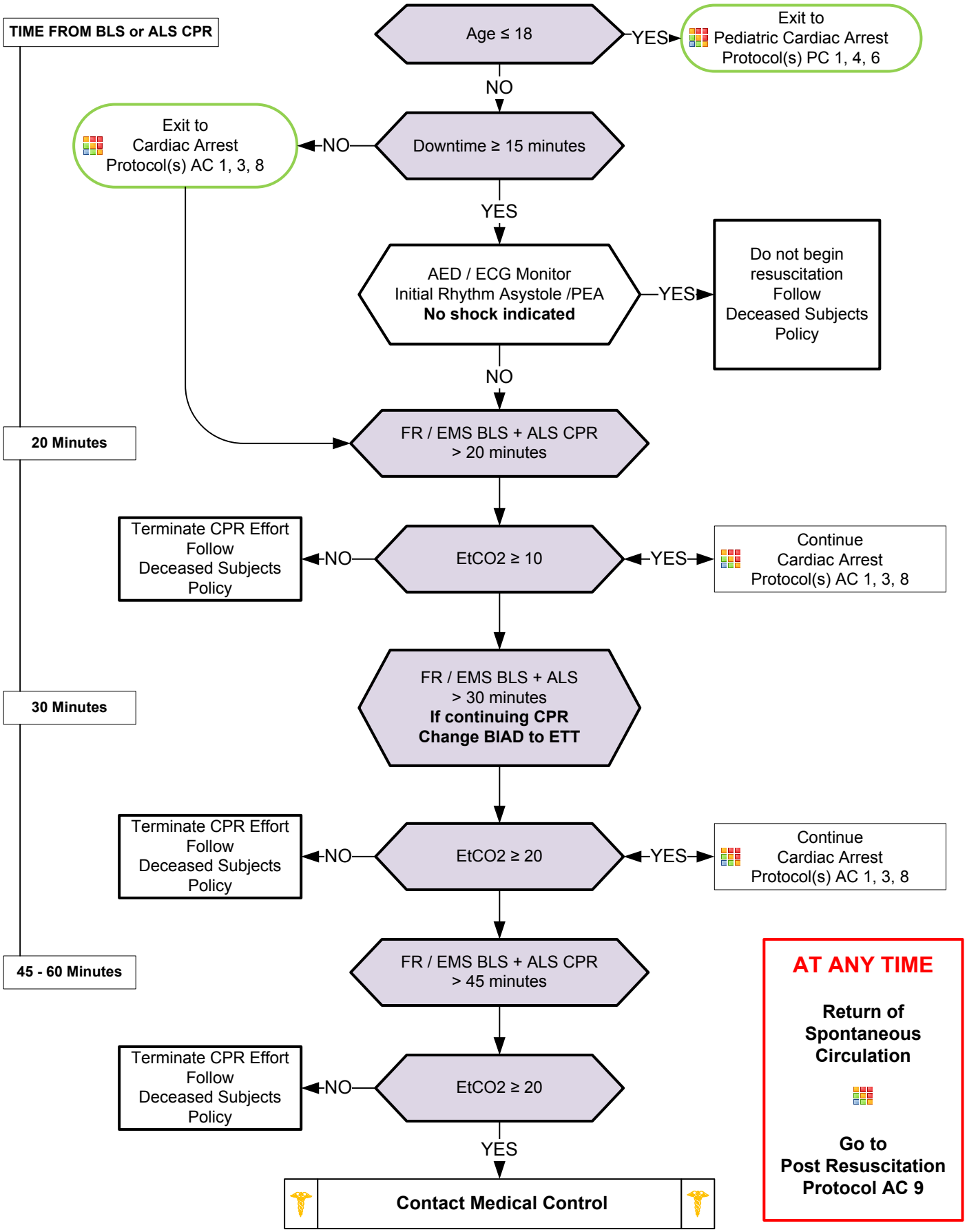
Incident Commander
Fire Department / First Responder Officer
Team Leader until ALS arrival
Manages Scene / Bystanders
Ensures high-quality compressions
Ensures frequent compressor change
Responsible for briefing family prior to ALS arrival

Team Focused CPR

Pearls

- **This protocol is optional and given only as an example. Agencies may and are encouraged to develop their own.**
- **Team Focused Approach / Pit-Crew Approach recommended; assign responders to predetermined tasks. Refer to optional protocol or development of local agency protocol.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.** Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.

On Scene Resuscitation
Termination of CPR



Adult Cardiac Protocol Section

This protocol has been altered from the original NCCEP Protocol by the local EMS Medical Director

On Scene Resuscitation / Termination of CPR

Pearls.

- **General approach:**
  1. **Determine if a terminal disease is involved?**
  2. **Is there an advanced directive such as a DNR / MOST form?**
  3. **Did the patient express to your historian any desires regarding resuscitation and if so what measures?**
  4. **Remember a living will is not a DNR.**

  Obtain a history while resuscitation efforts are ongoing. Determine the most legitimate person on scene as your information source such as a spouse, child, or sibling or Durable Health Care Power of Attorney.

Allergic Reaction / Anaphylaxis

History
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

Signs and Symptoms
- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- N/V

Differential
- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF

Assess Symptom Severity / Suspected Exposure to Allergen

MILD
Skin Only

B	**Diphenhydramine 25 - 50 mg PO**
A	IV Procedure ***if indicated***
A	**Diphenhydramine 25 - 50 mg PO / IV / IM / IO**
A	**Histamine (H2) Blocker** *If available*
B	Monitor and Reassess Monitor for Worsening Signs and Symptoms

MODERATE
2 + Body Systems

	Epinephrine 1:1000 IM 0.3 – 0.5 mg *if available*
B	**Diphenhydramine 25 - 50 mg PO** *See Pearls*
B	**Albuterol Nebulizer 2.5 – 5 mg** Repeat as needed x 3 ***if indicated***
A	**Diphenhydramine 25 - 50 mg IV / IM / IO *if not already given PO***

SEVERE
2 + Body Systems + hypotension
Or Isolated Hypotension

	Epinephrine 1:1000 IM 0.3 – 0.5 mg *if available*
B	**Albuterol 2.5 – 5 mg** Nebulizer Repeat as needed x 3 ***if indicated***
	Airway Protocol(s) AR 1 - 4 ***if indicated***
	Hypotension / Shock Protocol AM 5 ***if indicated***

A	**Epinephrine 1:1000 0.3 – 0.5 mg IM** Repeat in 5 minutes if no improvement
A	IV / IO Procedure
A	**Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg** Repeat as needed x 3 ***if indicated***
A	**Histamine (H2) Blocker** *If available*
A	**Normal Saline Bolus 500 mL IV / IO** Repeat as needed **Maximum 2 Liters**
P	No improvement with IM Epinephrine **Epinephrine IV / IO** See Pearls for dosing regimen
P	**Methylprednisolone 125 mg IV / IO**

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

Allergic Reaction / Anaphylaxis

Epinephrine 1:100,000 infusion may be needed for severe allergic reaction unresolved by initial doses of epi IM/IV. Mix 1mg Epi in 1000ml of NS – Administer 1 mL per minute (severe unresolved after initial treatment or infusion – may need 1mg Epi in 1000mL of NS over 10 minutes).

Cardiac monitoring is indicated for moderate and severe reactions.

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdominal**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**
- **Epinephrine administration:**
  - **Drug of choice and the FIRST drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.)**
  - **IM Epinephrine should be administered in priority before or during attempts at IV or IO access.**
  - **Diphenhydramine and steroids have no proven utility in Moderate / Severe anaphylaxis and may be given only After Epinephrine. Diphenhydramine and steroids should NOT delay repeated Epinephrine administration.**
  - **In Moderate and Severe anaphylaxis Diphenhydramine may decrease mental status. Oral Diphenhydramine should NOT be given to a patient with decreased mental status and / or a hypotensive patient as this may cause nausea and / or vomiting.**
- **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrine infusion. Refer to section ABOVE for epi 1:100,000 infusion information. Contact Medical Control for appropriate dosing.**
- **Symptom Severity Classification:**
  - **Mild symptoms:**
    - **Flushing, hives, itching, erythema with normal blood pressure and perfusion.**
  - **Moderate symptoms:**
    - **Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.**
  - **Severe symptoms:**
    - **Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension/poor perfusion or isolated hypotension.**
- **Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.**
- **Angioedema** is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in **-il.**
- **Hereditary Angioedema** involves swelling of the face, lips, airway structures, extremities, and may cause moderate to severe abdominal pain. Some patients are prescribed specific medications to aid in reversal of swelling. **Paramedic may assist or administer this medication per patient / package instructions.**
- **12 lead ECG and cardiac monitoring should NOT delay administration of epinephrine.**
- **EMR / EMT may administer Epinephrine IM and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to EMR / EMT administering any medication.
- **EMR / EMT may administer Epinephrine IM via AutoInjector or manual draw-up** per Agency Medical Director.
- **EMT may administer diphenhydramine by oral route only and may administer from EMS supply**. Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.

Diabetic; Adult

History
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

Signs and Symptoms
- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

Differential
- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status

Blood Glucose Analysis Procedure

B — 12 Lead ECG Procedure ***if indicated***

A — IV / IO Procedure

P — Cardiac Monitor

Altered Mental Status Protocol UP 4 ***if indicated***

Hypotension / Shock Protocol AM 5 ***if indicated***

Suspected Stroke Protocol AM 7 ***if indicated***

Seizure Protocol UP 13 ***if indicated***

A

Blood Glucose ≤ 69 mg / dl and symptomatic
No venous access
Dextrose - rectal
Repeat in 15 minutes if needed

Blood Sugar ≤ 69 mg / dl

Consider Oral Glucose Solution *if available*

Consider Oral Solution (Juices / Food)

A

If no improvement

D50% / D25% / D10% / D5%
12.5 - 25 gm IV / IO
May repeat until Blood Glucose ≥ 80 mg/dL

Blood Sugar 70 – 249 mg / dl

Blood Glucose Analysis Procedure ***if condition changes***

Exit to Appropriate Protocol(s)

Blood Sugar ≥ 250 mg / dl

A

Normal Saline Bolus
500 mL IV / IO
May repeat as needed
Then infuse 150 mL / hr

Monitor and Reassess Every 5 minutes Until Blood Glucose ≥ 80 mg / dl

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

Diabetic; Adult

If using D50% IV or IO – consider placing the D50% in to 500ml of fluid for administration of the first 12.5g, and repeat if necessary.

Because diabetics tend to incur a disproportionate incidence of cardiac problems, consider ECG evaluation. If correction of dehydration, hypoglycemia, hyperglycemia, or acidosis fails to abolish a cardiac dysrhythmia, refer to appropriate protocol. Supplemental dextrose provides the best means for reversing hypoglycemia. For the hypoglycemic who merely displays confusion and has the ability to swallow and obey commands, oral ingestion of food, drink, or instant glucose is the preferred treatment. For any lethargic, stuporous, or comatose hypoglycemic patient or for one who is unable to swallow and to understand or obey your commands, who would possibly aspirate oral glucose, intravenous/intraosseous or rectal administration of dextrose is indicated.

Pearls

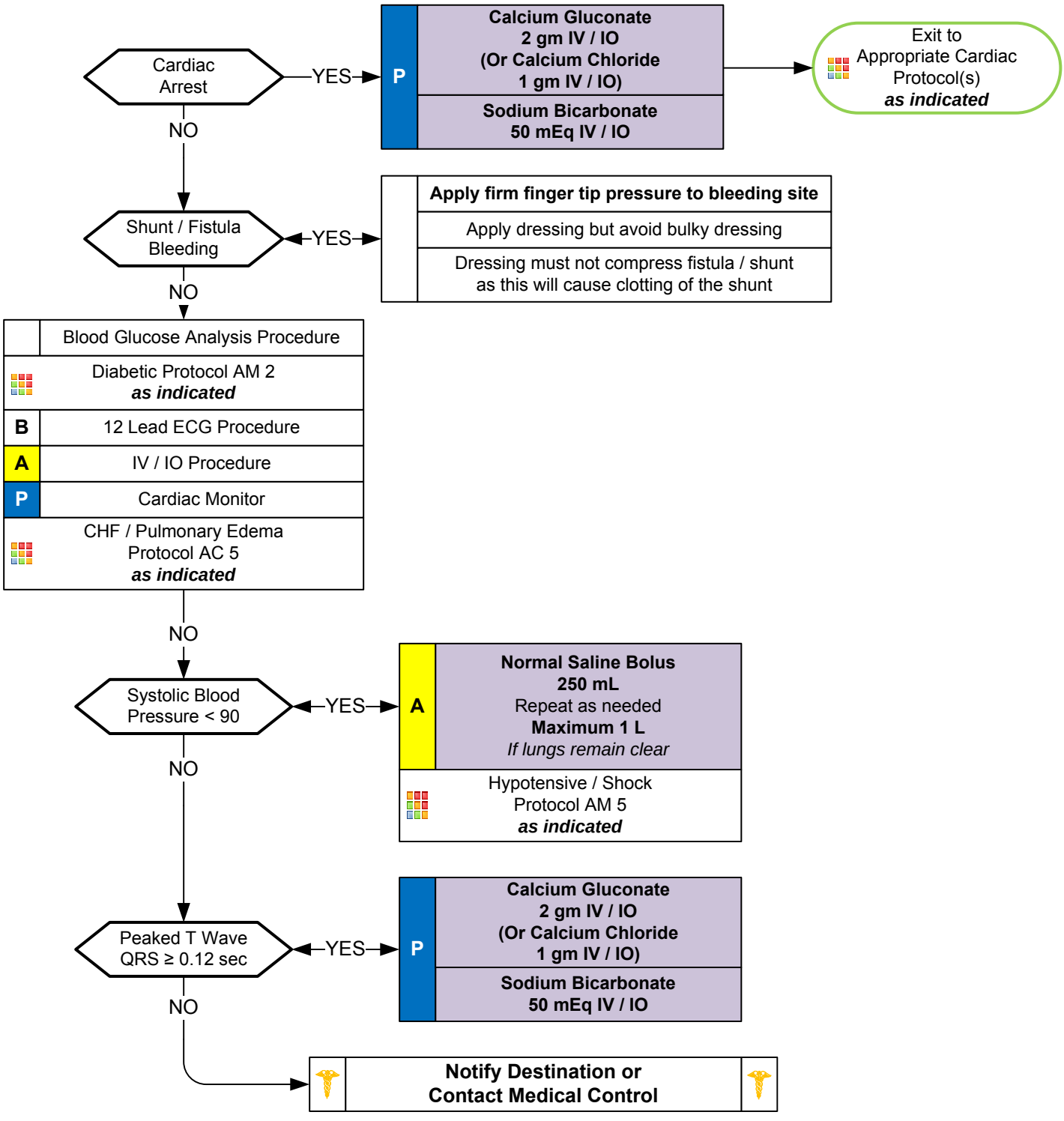
- **Recommended exam: Mental Status, Skin, Respirations and effort, Neuro.**
- **Patients with prolonged hypoglycemia my not respond to glucagon.**
- **Do not administer oral glucose to patients that are not able to swallow or protect their airway.**
- **Quality control checks should be maintained per manufacturers recommendation for all glucometers.**
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
  Blood sugar must be ≥ 80, patient has ability to eat and availability of food with responders on scene.
  Patient must have known history of diabetes and not taking any oral diabetic agents.
  Patient returns to normal mental status and has a normal neurological exam with no new neurological deficits.
  Must demonstrate capacity to make informed health care decisions. See Universal Patient Care Protocol UP-1.
  Otherwise contact medical control.
- **Hypoglycemia with Oral Agents:**
  Patient's taking oral diabetic medications should be encouraged to allow transportation to a medical facility.
  They are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after normal blood glucose is established.
  Not all oral agents have prolonged action so Contact Medical Control for advice.
  Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Hypoglycemia with Insulin Agents:**
  Many forms of insulin now exist. Longer acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established.
  Not all insulin have prolonged action so Contact Medical Control for advice.
  Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Congestive Heart Failure patients who have Blood Glucose > 250:**
  Limit fluid boluses unless they have signs of volume depletion, dehydration, poor perfusion, hypotension, and / or shock.
- In extreme circumstances with no IV / IO access and no response to glucagon, D50 can be administered rectally. Contact medical control for advice.

Dialysis / Renal Failure

History
- Peritoneal or Hemodialysis
- Anemia
- Catheter access noted
- Shunt access noted
- Hyperkalemia

Signs and Symptoms
- Hypotension
- Bleeding
- Fever
- Electrolyte imbalance
- Nausea and / or vomiting
- Altered Mental Status
- Seizure
- Arrhythmia

Differential
- Congestive heart failure
- Pericarditis
- Diabetic emergency
- Sepsis
- Cardiac tamponade



Adult Medical Protocol Section

Dialysis / Renal Failure

Pearls

- **Recommended exam: Mental status. Neurological. Lungs. Heart.**
- **Consider transport to medical facility capable of providing Dialysis treatment.**
- **Do not take Blood Pressure or start IV in extremity which has a shunt / fistula in place.**
- **Access of shunt indicated in the dead or near-dead patient only with no IV or IO access.**
- **If hemorrhage cannot be controlled with firm, uninterrupted direct pressure, application of tourniquet with uncontrolled dialysis fistula bleeding is indicated.**
- **Hemodialysis:**
  Process which removes waste from the blood stream and occurs about three times each week.
  Some patients do perform hemodialysis at home.
- **Peritoneal dialysis:**
  If patient complains of fever, abdominal pain, and / or back pain, bring the PD fluid bag, which has drained from the abdomen, to the hospital.

Complications of Dialysis Treatment:

Hypotension:
Typically responds to small fluid bolus of 250 mL Normal Saline. May result in angina, AMS, seizure or arrhythmia.

Filtration and decreased blood levels of some medications like some seizure medications:

Disequilibrium syndrome:
Shift of metabolic waste and electrolytes causing weakness, dizziness, nausea and / or vomiting and seizures.

Equipment malfunction:
Air embolism.
Bleeding.
Electrolyte imbalance.
Fever.

- **Fever:**
  Consider sepsis in a dialysis patient with any catheter extending outside the body.
- Always consider Hyperkalemia in all dialysis or renal failure patients.
- Sodium Bicarbonate and Calcium Chloride / Gluconate should not be mixed. Ideally give in separate lines.
- Renal dialysis patients have numerous medical problems typically. Hypertension and cardiac disease are prevalent.

Hypertension

History
- Documented Hypertension
- Related diseases: Diabetes; CVA; Renal Failure; Cardiac Problems
- Medications for Hypertension
- Compliance with Hypertensive Medications
- Erectile Dysfunction medications
- Pregnancy

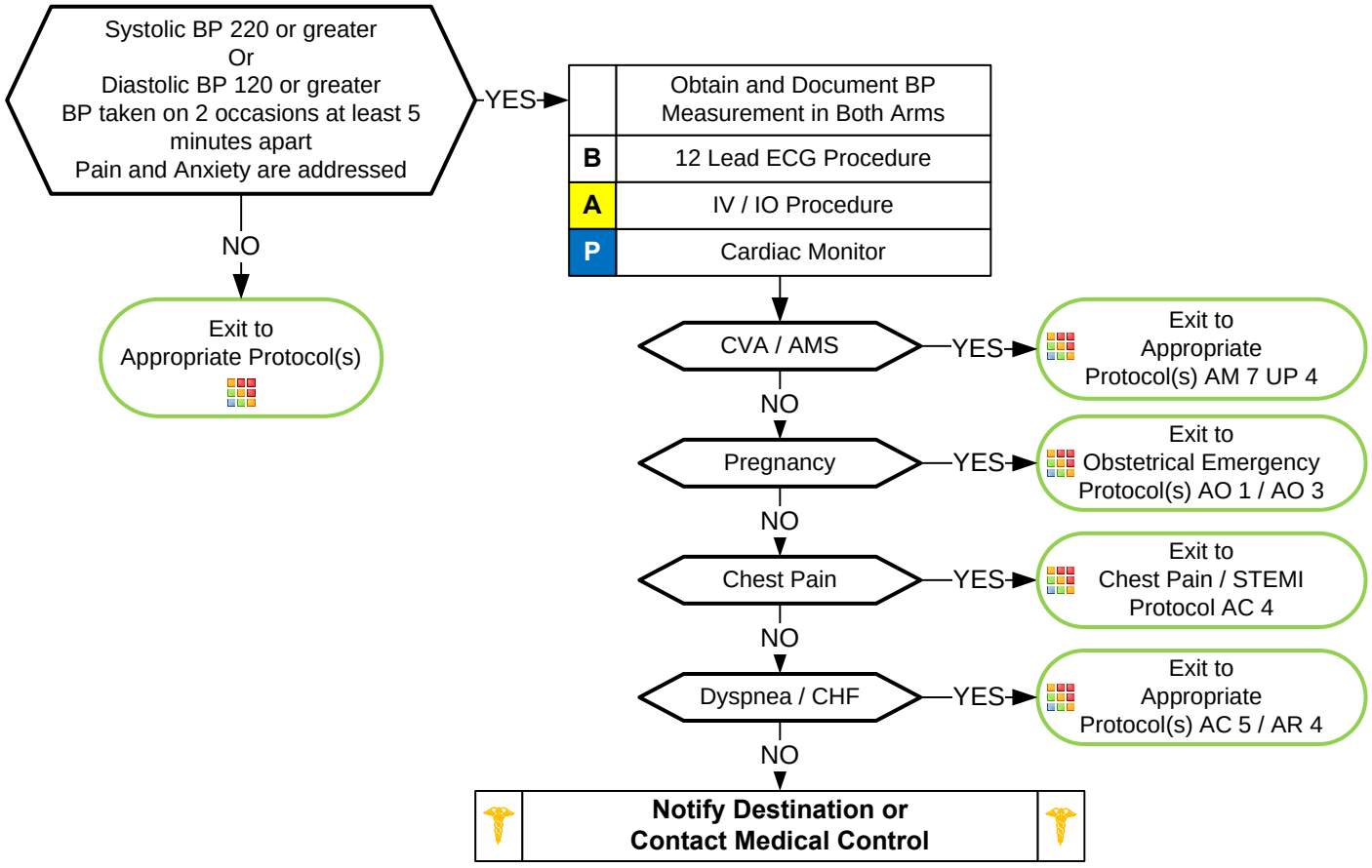
Signs and Symptoms

One of these
- Systolic BP 220 or greater
- Diastolic BP 120 or greater

AND at least one of these
- Headache
- Chest Pain
- Dyspnea
- Altered Mental Status
- Seizure

Differential
- Hypertensive encephalopathy
- Primary CNS Injury
  - Cushing's Response with Bradycardia and Hypertension
- Myocardial Infarction
- Aortic Dissection / Aneurysm
- Pre-eclampsia / Eclampsia

Hypertension is not uncommon especially in an emergency setting. Hypertension is usually transient and in response to stress and / or pain. A hypertensive emergency is based on blood pressure along with symptoms which suggest an organ is suffering damage such as MI, CVA or renal failure. This is very difficult to determine in the pre-hospital setting in most cases. Aggressive treatment of hypertension can result in harm. Most patients, even with significant elevation in blood pressure, need only supportive care. Specific complaints such as chest pain, dyspnea, pulmonary edema or altered mental status should be treated based on specific protocols and consultation with Medical Control.



Adult Medical Protocol Section

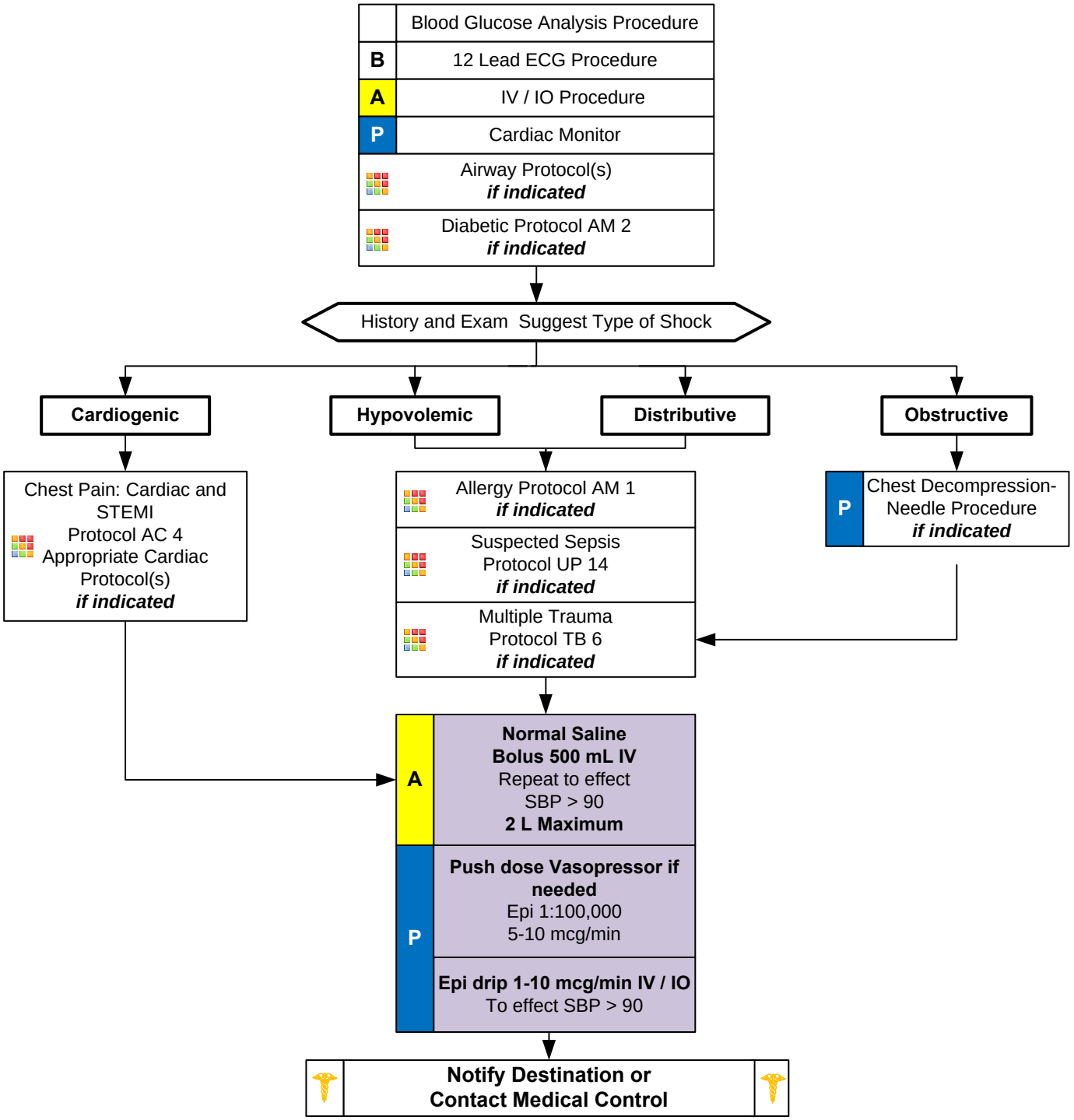
Pearls
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- Elevated blood pressure is based on two to three sets of vital signs.
- Symptomatic hypertension is typically revealed through end organ dysfunction to the cardiac, CNS or renal systems.
- All symptomatic patients with hypertension should be transported with their head elevated at 30 degrees.
- Ensure appropriate size blood pressure cuff utilized for body habitus.

Hypotension / Shock

History
- Blood loss - vaginal or gastrointestinal bleeding, AAA, ectopic
- Fluid loss - vomiting, diarrhea, fever
- Infection
- Cardiac ischemia (MI, CHF)
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

Signs and Symptoms
- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

Differential
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect / overdose
- Vasovagal
- Physiologic (pregnancy)
- Sepsis



Adult Medical Protocol Section

Hypotension / Shock

Septic Shock
Skin – Varies from flushed pink (if fever is present) to pale and cyanotic, possible petechia, possible purple blotches, possible peeling (general or at palms and soles), red streaks progressing proximally
Blood Pressure – Early: cardiac output increases but toxins may cause loss of peripheral vascular resistance
Blood Pressure – Late: Hypotension; precipitous fall in blood pressure
Respiration – Dyspnea with altered lung sounds
Other – Possible high fever (except some elderly and very young patients),
Other – Late: frank pulmonary edema

Septic shock is the result of an overwhelming infection. Sepsis may not be noticed for some time and may be confused with a wide variety of other conditions. Sepsis begins with an infection that sets in motion an overwhelming systemic response from the immune system, eht end results of which are hypotension, hypoperfusion, and end organ dysfunction. The infection can be caused by bacteria, fungus, and some viruses. Gramnegative bacteremia is more likely to cause sepsis (50 percent of infections) compared to gram-positive bacteremia (25 percent of infections). The inflammatory and cellular events are complex and significant. Organisms invade the body through the loodstream or locally. In either case, the organisms release structural components (commonly referred to as toxins, either endotoxins or exotoxins) that trigger our natural immune system to release its own endogenous mediators (e.g., cytokines from monocytes and prostaglandins from neutrophils, along with histamine, heparin, tumor necrosis factor [TNF], and others).

Adrenal crisis, also known as Addisonian crisis and acute adrenal insufficiency, is a medical emergency and potentially life-threatening situation requiring immediate emergency treatment. It is a constellation of symptoms that indicate severe adrenal insufficiency caused by insufficient levels of the hormone cortisol. The signs and symptoms may include:
- Pain in the lower back, flank, abdomen, or legs
- Severe vomiting and diarrhea, leading to dehydration
- Low blood pressure
- Loss of consciousness
- High potassium (hyperkalemia) and low sodium (hyponatremia)

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Hypotension can be defined as a systolic blood pressure of less than 90. This is not always reliable and should be interpreted in context and patients typical BP if known. Shock may be present with a normal blood pressure initially.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all possible causes of shock and treat per appropriate protocol.**
- For non-cardiac, non-trauma hypotension, consider Dopamine when hypotension unresponsive to fluid resuscitation.
- **Hypovolemic Shock:**
  Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.
  Tranexamic Acid (TXA):
  Agencies utilizing TXA must have approval from your T-RAC.
- **Cardiogenic Shock:**
  Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventrical / septum / valve / toxins.
- **Distributive Shock:**
  Sepsis
  Anaphylactic
  Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
  Toxins
- **Obstructive Shock:**
  Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.
  Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- **Acute Adrenal Insufficiency or Congenital Adrenal Hyperplasia:**
  Body cannot produce enough steroids (glucocorticoids / mineralocorticoids.) May have primary or secondary adrenal disease, congenital adrenal hyperplasia, or more commonly have stopped a steroid like prednisone. Injury or illness may precipitate. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain. **If suspected Paramedic should give Methylprednisolone 125 mg IM / IV / IO or Dexamethasone 10 mg IM / IV / IO. Use steroid agent specific to your drug list. May administer prescribed steroid carried by patient IM / IV / IO. Patient may have Hydrocortisone (Cortef or Solu-Cortef). Dose: < 1y.o. give 25 mg, 1-12 y.o. give 50 mg, and > 12 y.o. give 100 mg or dose specified by patient's physician.**

Suspected Stroke: Activase / t-PA

Obtain / Document VS prior to transport

SBP ≥ 185
DBP ≥ 110

YES → Patient must be stabilized BEFORE transport initiated
SBP < 185
DBP < 110

NO

Assess / Document GCS / Pupil exam

Nothing by mouth / NPO

Prehospital Stroke Screen

Maintain SaO2 ≥ 94 %

P
- Cardiac Monitor
- Verify **Activase / t-PA** bolus dose
  Verify total dose
- Document time infusion initiated
  Document estimated time of dose completion
- Reassess VS every 15 minutes
  Repeat neurological exam every 15 minutes
  Obtain BP readings in limb without infusion

Any of following:
Severe headache
Worsening of neurological exam
Nausea / Vomiting
Allergic reaction
Excessive bleeding

P
Stop
IV Activase / t-PA infusion

SBP ≥ 180 and/or DBP ≥ 105
And
NO antihypertensive medication infusion initiated by transferring hospital

YES →
P **Labetalol 10 mg IV / IO**
Contact Medical Control or Receiving Facility

NO

Antihypertensive medication infusion initiated by transferring hospital

YES →
P
Labetalol: Increase 2 mg/min
every 10 minutes
Titrate SBP < 180 mmHg
DBP < 105 mmHg
Maximum 8mg/min
Or
Nicardipine: Increase 2.5 mg/hr
every 5 minutes
Titrate SBP < 180 mmHg
DBP < 105 mmHg
Maximum 15 mg/hr

NO

SBP < 140 and/or DBP < 80

YES →
P
- Stop Anti-hypertensive agent
- Continue **Activase / t-PA** infusion

NO

P
Reassess VS every 15 minutes
Repeat neurological exam every 15 minutes
Obtain BP readings in limb without infusion

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

Suspected Stroke: Activase / t-PA (Optional)

Pearls

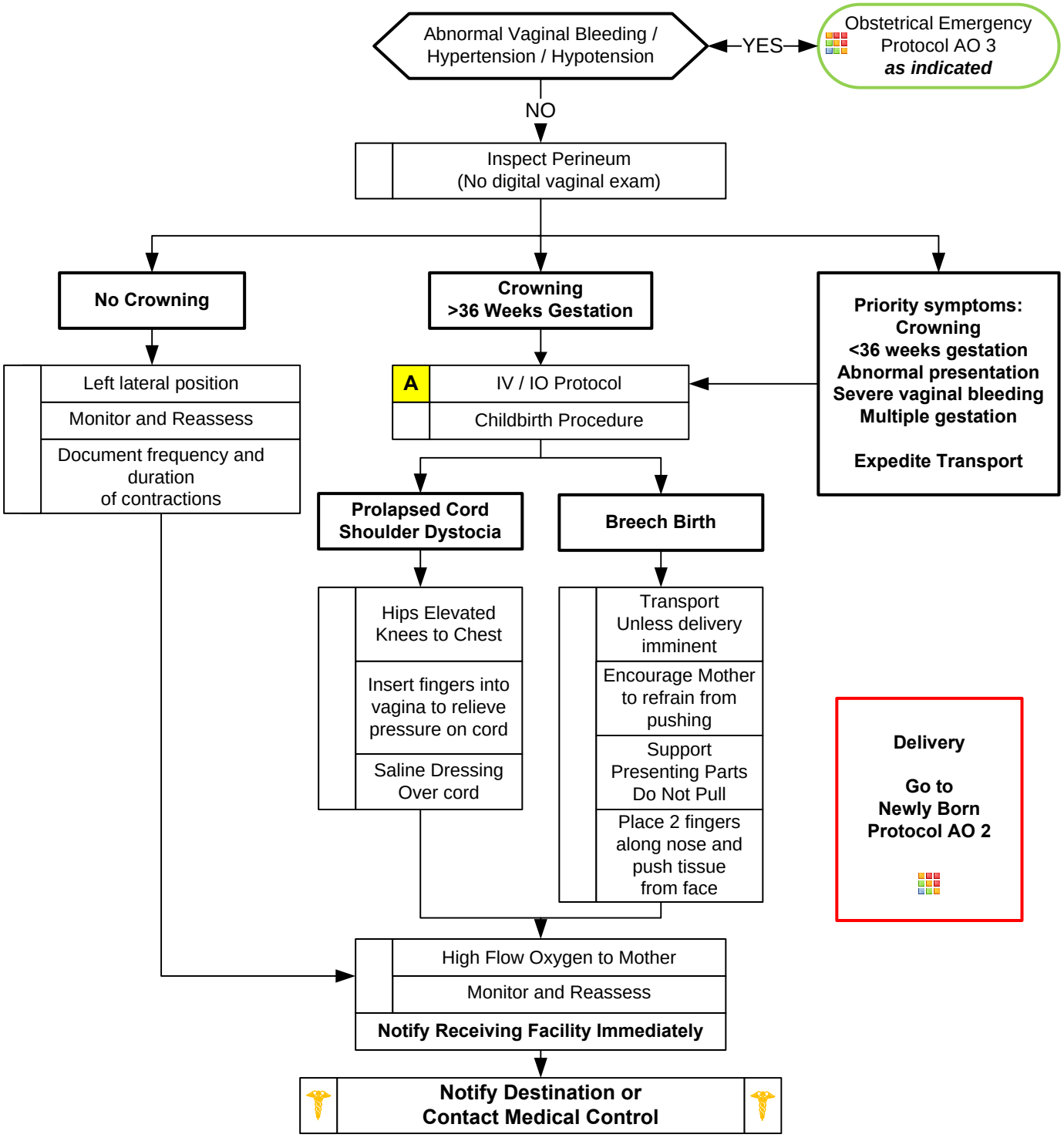
- **This protocol is intended for interfacility transfer patients only. Medication must be started at initial treating hospital.**
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used in protocol compliance.**
- **The Reperfusion Checklist should be completed for any suspected stroke patient.**
- **Onset of symptoms** is defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as an onset time when the patient went to sleep or last time known to be symptom free.)
- The differential listed on the Altered Mental Status Protocol should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration).
- Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.
- **Infusion Pump Alarm / No Flow:**
  Remove drip chamber from Activase / t-PA bag.
  Spike Activase / t-PA drip chamber to NS bag.
  Restart infusion to complete medication remaining in IV tubing.
- **Medication dosing safety:**
  When IV **Activase / t-PA** dose administration will continue en route, verify estimated time of completion.
  Verify with sending hospital that excess **Activase / t-PA** has been withdrawn from the bottle and wasted.
  This ensures the bottle will be empty when the full dose is finished. *For example, if the total dose is 70 mg, then 30 cc should be withdrawn and wasted since a 100 mg bottle of **Activase / t-PA** contains 100 mL of fluid when reconstituted.*
  Sending hospital should apply a label to **Activase / t-PA** bottle with the number of mL of fluid that should be in the bottle in case of pump failure during transit.
- **Allergy / Anaphylaxis:**
  Activase / t-PA, is structurally identical to endogenous t-PA and therefore should not induce allergy, single cases of acute hypersensitivity reactions have been reported.
  Angioedema:
  Rapid swelling (edema) of the dermis, subcutaneous tissue, mucosa and submucosal tissues. Typically involves the face, lips, tongue and neck.
  Almost always self limiting but may progress to interfere with airway / breathing so close monitoring is warranted.
  Utilize the Allergy / Anaphylaxis Protocol as indicated and also for angioedema. Infusion should be stopped.
  Give all medications related to the Allergy / Anaphylaxis Protocol by IV route only as patient should remain NPO.

Childbirth / Labor

History
- Due date
- Time contractions started / how often
- Rupture of membranes
- Time / amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Gravida / Para Status
- High Risk pregnancy

Signs and Symptoms
- Spasmodic pain
- Vaginal discharge or bleeding
- Crowning or urge to push
- Meconium

Differential
- Abnormal presentation
  - Buttock
  - Foot
  - Hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta



Adult Obstetrical Protocol Section

Childbirth / Labor

Pearls

- **Recommended Exam (of Mother): Mental Status, Heart, Lungs, Abdomen, Neuro**
- **Record APGAR at 1 minute and 5 minutes after birth.**
- **After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control post-partum bleeding.**
- Document all times (delivery, contraction frequency, and length).
- **Transport or Delivery?**
  Decision to transport versus remain and deliver is multifactorial and difficult. Generally it is preferable to transport. Factors that will impact decision include: number of previous deliveries; length of previous labors; frequency of contractions; urge to push; and presence of crowning.
- **Maternal positioning for labor:**
  Supine with head flat or elevated per mother's choice. Maintain flexion of both knees and hips. Elevated buttocks slightly with towel. If delivery not imminent, place mother in the left, lateral recumbent position with right side up about 10 – 20°.
- **Umbilical cord clamping and cutting:**
  Place first clamp about 10 cm from infant's abdomen and second clamp about 5 cm away from first clamp.
- **Multiple Births:**
  Twins occur about 1/90 births. Typically manage the same as single gestation. If imminent delivery call for additional resources, if needed. Most twins deliver at about 34 weeks so lower birth weight and hypothermia are common. Twins may share a placenta so clamp and cut umbilical cord after first delivery. Notify receiving facility immediately.
- If maternal seizures occur, refer to the Obstetrical Emergencies Protocol.
- Some perineal bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.

Newly Born

History
- Due date and gestational age
- Multiple gestation (twins etc.)
- Meconium / Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors such as substance abuse or smoking

Signs and Symptoms
- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal)
- Altered level of responsiveness
- Bradycardia

Differential
- Airway failure
  - Secretions
  - Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia, Hypoglycemia, Hypothermia
- Congenital heart disease

Breathing or Crying?
Term Gestation?
Good Muscle Tone?

ALL YES →
- Infant with mother if possible
- Provide warmth / Dry infant
- Maintain normal temperature
- Clear airway if necessary
- Monitor and Reassess

ANY NO ↓
- Warm, Dry and Stimulate
- Clear airway if necessary

Agonal breathing or Apnea?
Heart Rate < 100 / min
Labored breathing or Persistent cyanosis

YES →
- Position and clear airway if necessary
- Supplemental Oxygen
- BVM Ventilations
- **B** Pulse Oximetry Right Hand
- **P** Cardiac Monitor / 3 – Lead

Heart Rate < 100

YES →
- Check chest movement
- Change airway position
- Change BVM Technique
- Pediatric Airway Protocol(s) AR 5, 6 ***if no improvement***

NO ↓
- Supplemental Oxygen
- Maintain SpO2 ≥ 94 %
- Maintain warmth
- Monitor and Reassess

Heart Rate < 60

YES →
- Chest Compressions
- Pediatric Airway Protocol(s) AR 5, 6
- IV / IO Procedure
- **A** **Epinephrine 1:10,000**
  0.01 mg /kg IV / IO
  Every 3 to 5 minutes as needed
- **Normal Saline Bolus**
  10 mL / kg IV / IO
  May repeat x 1

NO ↓

Notify Destination or Contact Medical Control

Adult Obstetrical Protocol Section

Newly Born

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro**
- **Document 1 and 5 minute Apgars in PCR**
- **Most newborns requiring resuscitation respond to ventilations / BVM, compressions, and/or epinephrine. If infant not responding consider hypovolemia, pneumothorax, and/or hypoglycemia (< 40 mg/dL).**
- **Term gestation, strong cry / breathing and with good muscle tone generally will need no resuscitation. Routine suctioning is no longer recommended.**
- **Most important vital signs in the newly born are respirations / respiratory effort and heart rate.**
- **Maintain warmth of infant following delivery; cap, plastic wrap, thermal mattress, radiant heat.**
- **Meconium staining:**
  Infant born through meconium staining who is not vigorous: Positive pressure ventilation is recommended, direct endotracheal suctioning is no longer recommended.
- **Expected Pulse Oximetry readings immediately following birth:**

1 minute	**60 – 65%**
2 minutes	**65 – 70%**
3 minutes	**70 – 75%**
4 minutes	**75 – 80%**
5 minutes	**80 – 85%**
10 minutes	**85 – 95%**

- Heart rate is critical during the first few moments of life and is best assessed by 3-lead ECG.
- Pulse oximetry should be applied to the right upper arm, wrist, or palm.
- CPR in infants is 120 compressions/minute with a 3:1 compression to ventilation ratio. 2-thumbs encircling chest and supporting the back is recommended. Limit interruptions of chest compressions.
- Maternal sedation or narcotics will sedate infant (Naloxone NO LONGER recommended-supportive care only).
- D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline)

Obstetrical Emergency

History
- Past medical history
- Hypertension meds
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

Signs and Symptoms
- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension
- Severe headache
- Visual changes
- Edema of hands and face

Differential
- Pre-eclampsia / Eclampsia
- Placenta previa
- Placenta abruptio
- Spontaneous abortion

Known or Suspected Pregnancy, Missed Period, Vaginal Bleeding, Abdominal Pain

YES

- Left lateral recumbant position
- Blood Glucose Analysis Procedure
- A: IV / IO Procedure
- P: Cardiac Monior
- Abdominal Pain, Vomiting and Diarrhea Protocol UP 3 **if indicated**
- Diabetic Protocol AM 2 / PM 2 **if indicated**
- Hypotension / Shock Protocol AM 5 / PM 5 **if indicated**

NO

Exit to Appropriate Protocol(s)

Seizure Activity

YES

P:
- **Midazolam 2.5 mg IV / IO** May repeat every 3 to 5 minutes as needed
- **Midazolam 5 mg IM**
- **Midazolam 2 mg IN**
- **Maximum 10 mg**
- **Magnesium Sulfate 2 g IV / IO** Over 2 – 3 minutes May repeat x 1

NO

Childbirth / Labor Protocol AO 1 **if indicated**

Monitor and Reassess

Notify Destination or Contact Medical Control

Adult Obstetric Protocol Section

Obstetrical Emergency

Pearls

- **Recommended Exam: Mental Status, Abdomen, Heart, Lungs, Neuro**
- **Midazolam 5 – 10 mg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access.**
- **Magnesium Sulfate should be administered as quickly as possible. May cause hypotension and decreased respiratory drive, but typically in doses higher than 6 g.**
- **Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation. Greater than 20 weeks generally require 4 to 6 hours of fetal monitoring. DO NOT suggest the patient needs an ultrasound.**
- **Ectopic pregnancy:**
  Implantation of fertilized egg outside the uterus, commonly in or on the fallopian tube. As fetus grows, rupture may occur. Vaginal bleeding may or may not be present. Many women with ectopic pregnancy do not know they are pregnant. Usually occurs within 5 to 10 weeks of implantation. Maintain high index of suspicion with women of childbearing age experiencing abdominal pain.
- **Preeclampsia:**
  Occurs in about 6% of pregnancies. Defined by hypertension and protein in the urine. RUQ pain, epigastric pain, N/V, visual disturbances, headache, and hyperreflexia are common symptoms.
  In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
  Risk factors: < 20 years of age, first pregnancy, multigestational pregnancy, gestational diabetes, obesity, personal or family history of gestational hypertension.
- **Eclampsia:**
  Seizures occurring in the context of preeclampsia. Remember, women may not have been diagnosed with preeclampsia.
- Maintain patient in a left lateral position, right side up 10 - 20° to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding - number of pads used per hour.

Adult Airway

Assess Respiratory Rate, Effort, Oxygenation
Is Airway / Breathing Adequate?

YES → Supplemental oxygen
Goal oxygen saturation ≥ 90%
Preferably ≥ 94%

Exit to
Appropriate Protocol(s)

NO

Basic Maneuvers First
-open airway chin lift / jaw thrust
-nasal or oral airway
-Bag-valve mask (BVM)

Spinal Motion Restriction
Procedure / Protocol TB 8
if indicated

Altered Mental Status Protocol UP 4
if indicated

Respiratory Distress with a
Tracheostomy Tube
Protocol AR 10
if indicated

Protocols AR 1, 2, and 3 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.

Airway Obstructed

YES →
- Airway Foreign Body Obstruction Procedure
- **A** Direct Laryngoscopy
- **P** Airway Cricothyrotomy Surgical Procedure ***if indicated***

NO

Breathing / Oxygenation
Support needed?

YES →
- Supplemental Oxygen
  BVM
  Maintain
  Oxygen Saturation ≥ 90 %
  Preferably ≥ 94 %
- **B** Consider Airway CPAP Procedure
- **B** Airway BIAD Procedure ***if indicated***
- **A** Oral / Nasotracheal Intubation Procedure
- **P** Chest Decompression Procedure ***if indicated***
- **P** Consider Airway Drug Assisted Protocol AR 3 ***if available***
- **P** Post-intubation / BIAD Management Protocol AR 8 ***if indicated***

NO

Monitor / Reassess
Supplemental Oxygen
if indicated

Exit to
appropriate protocol(s)

Unable to Ventilate and Oxygenate ≥ 90% during or after one (1) or more unsuccessful intubation attempts .
and/or
Anatomy inconsistent with continued attempts.
and/or
Three (3) unsuccessful attempts by most experienced Paramedic/ AEMT.

Exit to
Adult Failed Airway
Protocol AR 2

Notify Destination or
Contact Medical Control

Airway Respiratory Protocol Section

Adult Airway

Pearls

- **See Pearls section of protocols AR 2 and 3.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures.**
- **Intubation Attempt is passing the laryngoscope blade past the teeth or ETT inserted into the nasal passage.**
- **Capnometry or capnography is mandatory with all methods of intubation. Continuous capnography (EtCO2) is strongly recommended for the monitoring of all patients with a BIAD and mandatory with monitoring of an endotracheal tube.**
- **Ventilatory rate should be 8-10 per minute to maintain a EtCO2 of 35-45. Avoid hyperventilation.**
- **Anticipating the Difficult Airway and Airway Assessment**
  - **Difficult BVM Ventilation (MOANS): M**ask seal difficulty (hair, secretions, trauma); **O**bese, obstruction, OB – 2d and 3d trimesters; **A**ge ≥ 55; **N**o teeth; **S**tiff lungs or neck
  - **Difficult Laryngoscopy (LEON): L**ook externally for anatomical problems; **E**valuate 3-3-2 (Mouth opening should equal 3 of patients finger's width, mental area to neck should equal 3 of patient's finger's width, base of chin to thyroid prominence should equal 2 of patients finger's width); **O**bese, obstruction, OB – 2d and 3d trimesters; **N**eck mobility limited.
  - **Difficulty BIAD (RODS): R**estricted mouth opening; **O**bese, obstruction, OB – 2d and 3d trimesters; **D**istorted or disrupted airway; **S**tiff lungs or neck
  - **Difficulty Cricothyrotomy / Surgical Airway (SMART): S**urgery scars**; M**ass or hematoma**, A**ccess or anatomical problems**; R**adiation treatment to face, neck, or chest; **T**umor.
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- **Nasotracheal intubation: Procedure requires spontaneous breathing and may require considerable time, exposing patient to critical desaturation. Contraindicated in combative, anatomical disrupted or distorted airways, increased ICP, severe facial trauma, basal skull fracture, and head injury. Orotracheal route is preferred.**
- Maintain spinal motion restriction for patients with suspected spinal injury.
- AEMT and Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Gastric tube placement should be considered in all intubated patients if available or time allows.
- It is important to secure the endotracheal tube well to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Adult, Failed Airway

Protocols AR 1, 2, and 3 should be utilized together (even if agency is not using Drug Assisted Airway as they contain useful information for airway management.

Unable to Ventilate and Oxygenate ≥ 90% during
or after one (1) or more unsuccessful intubation attempts.
and/or
Anatomy inconsistent with continued attempts.
and/or
Three (3) unsuccessful attempts by most experienced Paramedic/AEMT.
Each attempt should include change in approach or equipment

NO MORE THAN THREE (3) ATTEMPTS TOTAL

Failed Airway ↔ Call for additional resources if available

BVM
Adjunctive Airway NP / OP
Maintains
Oxygen Saturation ≥ 90 %
Preferably ≥ 94 %

YES → Continue BVM
Supplemental Oxygen

Exit to
Appropriate Protocol(s)

NO

B	Attempt Airway Blind Insertion Airway Device Procedure
A	Airway Video Laryngoscopy Device Procedure ***if available***
P	Airway Cricothyrotomy Surgical Procedure
	Supplemental oxygen BVM with Airway Adjuncts Maintain Oxygen Saturation ≥ 90 % Preferably ≥ 94 %
	Post-intubation BIAD Management Protocol AR 8

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Adult, Failed Airway

A failed airway occurs when a provider begins a course of airway management by endotracheal intubation and identifies that intubation by that means will not succeed.

Conditions which define a Failed Airway:
1. Failure to maintain adequate oxygen saturation 90% or greater after 2 or more failed intubation attempts.
2. Three (3) failed attempts at intubation by the most experienced prehosptial provider on scene even when adequate oxygen saturation of 90% or greater can be maintained.
3. Unable to maintain adequate oxygen saturation 90% or greater with BM ventilation techniques and insufficient time to attempt alternative maneuvers. A patient near death or dying.

The most important way to avoid a failed airway is to identify patients with expected difficult airway, difficult BM ventilations, difficult BIAD, difficult laryngoscopy and / or difficult cricothyrotomy.

Please refer to Adult Airway Protocol for more information on how to identify the patient with the potential difficult airway.

Position of patient:
In the field setting improper position of the patient and rescuer are responsible for many failed and difficult intubations. Often this is dictated by uncontrolled conditions present at the scene and we must adapt. However many times the rescuer does not optimize the patient and rescuer position. The sniffing position or the head simply extended upon the neck are probably the best positions. The goal is to align the ear canal with the suprasternal notch in a straight line.

In the obese or late pregnant patient, elevating the torso by placing blankets, pillows or towels will optimize the position. This can be facilitated by raising the head of the cot.

Use of cot in optimal patient / rescuer position:
The cot can be elevated and lowered to facilitate intubation. With the patient on the cot raise until the patient's nose is at the level of your umbilicus which will place you at the optimal position.

Pearls

- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures.**
- **Anticipating the Difficult Airway and Airway Assessment**
  - **Difficult BVM Ventilation (MOANS): M**ask seal difficulty (hair, secretions, trauma); **O**bese, obstruction, OB – 2d and 3d trimesters; **A**ge ≥ 55; **N**o teeth; **S**tiff lungs or neck
  - **Difficult Laryngoscopy (LEON): L**ook externally for anatomical problems; **E**valuate 3-3-2 (Mouth opening should equal 3 of patients finger's width, mental area to neck should equal 3 of patient's finger's width, base of chin to thyroid prominence should equal 2 of patients finger's width); **O**bese, obstruction, OB – 2d and 3d trimesters; **N**eck mobility limited.
  - **Difficulty BIAD (RODS): R**estricted mouth opening; **O**bese, obstruction, OB – 2d and 3d trimesters; **D**istorted or disrupted airway; **S**tiff lungs or neck
  - **Difficulty Cricothyrotomy / Surgical Airway (SMART): S**urgery scars**; M**ass or hematoma**, A**ccess or anatomical problems**; R**adiation treatment to face, neck, or chest; **T**umor.
- **If first intubation attempt fails, make an adjustment and then consider:**
  - Different laryngoscope blade / Video or other optical laryngoscopy devices
  - Gum Elastic Bougie
  - Different ETT size
  - Change head positioning
- AEMT and Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Continuous pulse oximetry should be utilized in all patients with inadequate respiratory function.
- Continuous EtCO2 should be applied to all patients with respiratory failure or to all patients with advanced airways.
- **Notify Medical Control AS EARLY AS POSSIBLE concerning the patient's difficult / failed airway.**
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Airway, Drug Assisted

Indications for Drug Assisted Airway
Failure to protect the airway
and/or
Unable to oxygenate
and/or
Unable to ventilate
and/or
Impending airway compromise

Procedure will remove patient's protective airway reflexes and ability to ventilate.

You must be sure of your ability to intubate before beginning this procedure.

Must have two (2) Paramedics on scene

Protocols AR 1, 2, and 3 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.

	Preoxygenate 100% O2
A	IV / IO Procedure (preferably 2 sites)
P	Assemble Airway Equipment Suction equipment Alternative Airway Device

Hypoxic Or Hypotension Or Dangerously Combative? — YES →

P	**Airway Management** **Ketamine 1.5 - 2 mg/kg IV / IO** **Airway Management + Dangerously Combative** **Ketamine 300 – 400 mg IM** **Ketamine 1.5 - 2 mg/kg IV / IO**
	Correct Hypoxia and / or Hypotension
	Adult Airway Adult Failed Airway Protocol(s) AR 1, 2 ***as indicated***
	Hypotension / Shock Protocol AM 5 ***as indicated***

NO ↓

P	**Etomidate 0.3 mg/kg IV / IO** **Or** **Ketamine 1.5 - 2 mg/kg IV / IO** **May repeat x 1**
P	**Succinylcholine 1.5 mg / kg IV/ IO** ***Or*** **Rocuronium 1 mg kg IV / IO** **(if Succinylcholine contraindicated)** **May repeat x 1**
P	**Intubate trachea**
P	**Placement Verified** **Continuous Capnography**

	Consider Restraints Physical Procedure
P	Consider Gastric Tube Insertion Procedure

Awakening or Moving after intubation — NO →

YES ↓

Exit to Post-intubation / BIAD Management Protocol AR 8

Notify Destination or Contact Medical Control

Red Text
are the key performance indicators used to evaluate protocol compliance.

An Airway Evaluation Form must be completed on every patient who receives Rapid Sequence Intubation.

Airway Respiratory Protocol Section

Airway, Drug Assisted

Most important caveat is determining the patient NOT APPROPRIATE for Rapid Sequence Intubation.

High Risk Patients:
Brain illness or injury; Underlying respiratory disease; Underlying cardiac disease; Aortic disease; Obese patients; Pregnant patients; and Patients age > 55. All pre-hospital Rapid Sequence Intubations are to be considered HIGH RISK.
Patients with anticipated difficult airway who can be managed by basic maneuvers / BVM / CPAP with adequate oxygenation and ventilation may require rapid transport only.
Refer to Adult Airway, and Adult Failed Airway protocols.
Specifically make sure you assess the difficulty in using a Bag Valve Mask, Laryngoscopy, BIAD, and Cricothyrotomy with each patient.

Preparation:
Assemble and test equipment. Oxygen, BVM, Suction, Laryngoscope, Gum Elastic Bougie, BIAD, Syringes, Medications, AirTraq and Cricothyrotomy device.
Assure large bore IV with 2 sites preferable.

Pre-oxygenate:
Pre-oxygenation should optimally occur during initial assessment.
Provide at least 3 minutes of high flow oxygen before rapid sequence intubation.
CPAP is an effective means to provide adequate pre-oxygenation.

Paralyze and Sedate:
Give Etomidate first then paralytic in rapid succession and via rapid IV push with normal saline flushes of 10 mL.
Once medications are given DO NOT VENTILATE unless patient de-saturates below 92%: Continue high flow oxygen by mask or nasal cannula and maintain jaw thrust to keep airway open. This is ***apneic oxygenation*** and is very effective in supplying oxygen to the blood stream even without ventilations as long as airway patency is maintained. Maintain until intubation conditions are reached and you begin your intubation attempt. Optimal condition should be reached in about 30 to 60 seconds.

Position:
Align external auditory canal with sternal notch. May need to elevate head / torso (pillows or stretcher) in the obese or pregnant patient. If difficulty is anticipated use your stretcher to place the patient's nose in line with your umbilicus.
Trauma: *Utilize in-line cervical stabilization during intubation, BIAD or BVM use. During intubation or BIAD the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.*

Place endotracheal tube into trachea:
Cricoid pressure may worsen your view and may increase risk of aspiration in some patients. Use if it improves your view.
Bimanual laryngoscopy: Use your right hand to externally manipulate the thyroid cartilage and / or head to give you the best glottic view.
Confirm placement of endotracheal tube into glottis by: Direct visualization; Chest rise and fall; Increasing oxygen saturation; End tidal CO2 device.
Maintain continuous waveform capnometry at all times to assure endotracheal tube does not become dislodged.

Post-intubation management:
Give Versed as needed to maintain sedation maintaining systolic blood pressure greater than 90.
Expect transient hypotension immediately following RSI.
Use Vecuronium only after adequate sedation if excessive patient movement is noted. Repeated doses of paralytics are discouraged.
Protect the airway with a combination of physical restraints, versed and vecuronium as needed.

Pearls

- **Agencies must maintain a separate Performance Improvement Program specific to Drug Assisted Airway.**
- **See Pearls section of protocols AR 1 and 2.**
- **This procedure requires at least 2 Paramedics. Divide the workload – ventilate, suction, cricoid pressure, drugs, intubation.**
- **Patients with hypoxia and/or hypotension are at risk of cardiac arrest when a sedative and paralytic medication are administered. Hypoxia and hypotension require resuscitation and correction prior to use of these combined agents. Ketamine allows time for appropriate resuscitation to occur during airway management.**
- **<u>This protocol is only for use in patients who are longer than the Broselow-Luten Tape.</u>**
- **Ketamine may be used during airway management of patients who FIT on the Broselow-Luten Tape with a DIRECT, ONLINE MEDICAL ORDER, by the system MEDICAL DIRECTOR OR ASSISTANT MEDICAL DIRECTOR ONLY.**
- **<u>KETAMINE:</u>**
  - **Ketamine may be used with and without a paralytic agent in conjunction with either a OP, NP, BIAD or endotracheal tube.**
  - **Ketamine may be used during the resuscitation of hypoxia or hypotension in conjunction with airway management. Once hypoxia and hypotension are corrected, use of a sedative and paralytic can proceed if indicated.**
  - **Ketamine may be used in the dangerously combative patient requiring airway management IM. IV / IO should be established as soon as possible.**
  - **Ketamine may NOT be used for purposes of sedation only – it must be used only during airway management procedures.**
- **Continuous Waveform Capnography and Pulse Oximetry are required for intubation verification and ongoing patient monitoring, though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended in this population.)**
- **Before administering any paralytic drug, screen for contraindications with a thorough neurologic exam.**
- **<u>If First intubation attempt fails, make an adjustment and try again: (Consider change of provider in addition to equipment)</u>**
- **Different laryngoscope blade**
- **Different ETT size**
- **Change head positioning**
- **Change cricoid pressure; No longer routinely recommended and may worsen your view.**
- **Align external auditory canal with sternal notch / proper positioning.**
- **Consider applying BURP maneuver (Back [posterior], Up, and to patient's Right)**
- Paramedics / AEMT should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Protect the patient from self-extubation when the drugs wear off. Longer acting paralytics may be needed post-intubation.
- Drug Assisted Airway is not recommended in an urban setting (short transport) when able to maintain oxygen saturation ≥ 90 %.
- Consider Naso or orogastric tube placement in all intubated patients to limit aspiration and decompress stomach if needed.
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Adult COPD / Asthma
Respiratory Distress

History
- Asthma; COPD -- chronic bronchitis, emphysema, congestive heart failure
- Home treatment (oxygen, nebulizer)
- Medications (theophylline, steroids, inhalers)
- Toxic exposure, smoke inhalation

Signs and Symptoms
- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi
- Use of accessory muscles
- Fever, cough
- Tachycardia

Differential
- Asthma
- Anaphylaxis
- Aspiration
- COPD (Emphysema, Bronchitis)
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pneumothorax
- Cardiac (MI or CHF)
- Pericardial tamponade
- Hyperventilation
- Inhaled toxin (Carbon monoxide, etc.)

	Adult Airway Protocol(s) ***as indicated***
	Adult Allergic Reaction / Anaphylaxis Protocol AM 1 ***as indicated***
B	12 Lead ECG Procedure
A	IV/ IO Procedure
P	Cardiac Monitor

Following Assessment

WHEEZING

B	**Albuterol Nebulizer 2.5 – 5 mg** Repeat as needed x 3

STRIDOR

B	**Albuterol Nebulizer 2.5 – 5 mg** Repeat as needed x 3
A	**Epinephrine Nebulizer 1 mg (1:1000) / 2 mL NS** May repeat x 1

	Adult Airway Protocol(s) ***as indicated***
B	Airway CPAP Procedure
A	**Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg** Repeat as needed x 3 ***if indicated***
A	Consider **Epinephrine 1:1000 0.3 – 0.5 mg IM**
P	**Methylprednisolone 125 mg IV / IO / IM**
P	**Magnesium Sulfate 2g IV / IO** Infuse over 10 – 20 minutes

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Adult COPD / Asthma
Respiratory Distress

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- **This protocol includes all patients with respiratory distress, COPD, Asthma, Reactive Airway Disease, or Bronchospasm. Patients may also have wheezing and respiratory distress with viral upper respiratory tract infections and pneumonia.**
- **Combination nebulizers containing albuterol and ipratropium:**
  Patients may receive more than 3 nebulizer treatments, treatments should continue until improvement. Following 3 combination nebulizers, it is acceptable to continue albuterol solely with subsequent treatments as there is no proven benefit to continual use of ipratropium.
- **Epinephrine:**
- **If allergic reaction or anaphylaxis is suspected, give immediately and repeat until improvement.**
- **If allergic reaction is not suspected, administer with impending respiratory failure and no improvement.**
- **Consider Magnesium Sulfate with impending respiratory failure and no improvement.**
- **Pulse oximetry should be monitored continuously and consider End-tidal CO2 monitoring if available.**
- **CPAP or Non-Invasive Positive Pressure Ventilation:**
- **May be used with COPD, Asthma, Allergic reactions, and CHF.**
- **Consider early in treatment course.**
- **Consider removal if SBP remains < 100 mmHg and not responding to other treatments.**
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.

Pediatric Airway

Assess Respiratory Rate, Effort, Oxygenation
Is Airway / Breathing Adequate?

YES → Supplemental oxygen
Goal oxygen saturation ≥ 90%
Preferably ≥ 94%

Exit to Appropriate Protocol(s)

NO

Basic Maneuvers First
-open airway chin lift / jaw thrust
-nasal or oral airway
-Bag-valve mask (BVM)

Spinal Motion Restriction Procedure / Protocol TB 8 ***if indicated***

Consider AMS Protocol UP 4

Respiratory Distress with a Tracheostomy Tube Protocol UP 13 ***if indicated***

Airway Obstructed

YES →

- Airway Foreign Body Obstruction Procedure
- **A** Direct Laryngoscopy
- **P** Airway Cricothyrotomy Needle Procedure **See Pearls Section**

NO

Breathing / Oxygenation Support needed

YES →

- Supplemental Oxygen BVM Maintain Oxygen Saturation ≥ 90 % Preferably ≥ 94 %
- **B** Airway BIAD Device Procedure ***if indicated***
- **A** Oral / Tracheal Intubation Procedure
- **P** Chest Decompression Procedure ***if indicated***
- **P** Consider Airway Drug Assisted Protocol AR 3 ***if available***
- **P** Post-intubation / BIAD Management Protocol AR 8 ***if indicated***

NO

Monitor /Reassess Supplemental Oxygen ***if indicated***

Exit to Appropriate Protocol(s)

Unable to Ventilate and Oxygenate ≥ 90% during or after one (1) or more unsuccessful intubation attempts .
and/or
Anatomy inconsistent with continued attempts.
and/or
Three (3) unsuccessful attempts by most experienced Paramedic/AEMT.

Exit to Pediatric Failed Airway Protocol AR 6

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Pediatric Airway

Pearls

- **For this protocol, pediatric is defined as any patient which can be measured within the Broselow-Luten tape.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Capnometry (color) or capnography is mandatory with all methods of intubation. Document results.**
- **Continuous capnography (EtCO2) is strongly recommended with BIAD or endotracheal tube use though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended).**
- **Ventilatory rate: 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 8 - 10 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**
- **Ketamine may be used during airway management of patients who FIT on the Broselow-Luten Tape with a DIRECT, ONLINE MEDICAL ORDER, by the system MEDICAL DIRECTOR OR ASSISTANT MEDICAL DIRECTOR ONLY. Specific use in this population of patients must also be for use in individual agencies by the NC OEMS State Medical Director prior to use.**
- **<u>Agencies utilizing Ketamine must submit a local systems plan to State Medical Director detailing how the drug is used in your program.</u>**
  - **Ketamine may be used with and without a paralytic agent in conjunction with either a OP, NP, BIAD or endotracheal tube.**
  - **Ketamine may be used during the resuscitation of hypoxia or hypotension in conjunction with airway management.**
  - **Ketamine may be used in the dangerously combative patient requiring airway management IM. IV / IO should be established as soon as possible.**
  - **Ketamine may NOT be used for purposes of sedation only – it must be used only during airway management procedures.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- AEMT and Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Gastric tube placement should be considered in all intubated patients.
- It is important to secure the endotracheal tube well and consider c-collar (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **<u>Airway Cricothyrotomy Needle Procedure:</u>**
  - **Indicated as a lifesaving / last resort procedure in pediatric patients ≤ 11 years of age.**
  - **Very little evidence to support it's use and safety.**
  - **A variety of alternative pediatric airway devices now available make the use of this procedure rare.**
  - **Agencies who utilize this procedure must develop a written procedure, establish a training program, maintain equipment and submit procedure and training plan to the State Medical Director / Regional EMS Office.**
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Pediatric Failed Airway

Unable to Ventilate and Oxygenate ≥ 90% during
or after one (1) or more unsuccessful intubation attempts.
and/or
Anatomy inconsistent with continued attempts.
and/or
Three (3) unsuccessful attempts by most experienced Paramedic / AEMT.
Each attempt should include change in approach
or equipment

NO MORE THAN THREE (3) ATTEMPTS TOTAL

Call for additional resources if available

Failed Aiway

BVM
Adjunctive Airway NP / OP
Maintains Oxygen Saturation
≥ 90 %
Preferably ≥ 94 %

YES → Continue BVM
Supplemental Oxygen

Exit to
Appropriate
Protocol(s)

NO

A Airway Video Laryngoscopy
Device Procedure
if available

B Attempt
Airway Blind Insertion Airway
Device Procedure

P Airway Cricothyrotomy
Needle Procedure
See Pearls Section

BIAD / Cricothyrotomy
Successful
Or
Oxygenation / Ventilation
Adequate

YES → Exit to
Post-intubation /
BIAD Management
Protocol AR 8

NO

Supplemental oxygen
BVM with Airway Adjunts
Maintain Oxygen Saturation
≥ 90 %
Preferably ≥ 94 %

Notify Destination or
Contact Medical Control

Pediatric Failed Airway

Pearls

- **For this protocol, pediatric is defined as any patient which can be measured within a Length-based Resuscitation Tape.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Capnometry (color) or capnography is mandatory with all methods of intubation. Document results.**
- **Continuous capnography (EtCO2) is strongly recommended with BIAD or endotracheal tube use though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended).**
- **Ventilatory rate: 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 8 – 10 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- **If first intubation attempt fails, make an adjustment and then try again:** Different laryngoscope blade; Gum Elastic Bougie; Different ETT size; Change cricoid pressure; Apply BURP; Change head positioning
- AEMT and Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Gastric tube placement should be considered in all intubated patients.
- It is important to secure the endotracheal tube well and consider c-collar (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **<u>Airway Cricothyrotomy Needle Procedure:</u>**
  Indicated as a lifesaving / last resort procedure in pediatric patients ≤ 11 years of age.
  Very little evidence to support it's use and safety.
  A variety of alternative pediatric airway devices now available make the use of this procedure rare.
  Agencies who utilize this procedure must develop a written procedure, establish a training program, maintain equipment and submit procedure and training plan to the State Medical Director / Regional EMS Office.
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Pediatric Asthma
Respiratory Distress

History
- Time of onset
- Possibility of foreign body
- Past Medical History
- Medications
- Fever / Illness
- Sick Contacts
- History of trauma
- History / possibility of choking
- Ingestion / OD
- Congenital heart disease

Signs and Symptoms
- Wheezing / Stridor / Crackles / Rales
- Nasal Flaring / Retractions / Grunting
- Increased Heart Rate
- AMS
- Anxiety
- Attentiveness / Distractability
- Cyanosis
- Poor feeding
- JVD / Frothy Sputum
- Hypotension

Differential
- Asthma / Reactive Airway Disease
- Aspiration
- Foreign body
- Upper or lower airway infection
- Congenital heart disease
- OD / Toxic ingestion / CHF
- Anaphylaxis
- Trauma

Pediatric Airway Protocol(s) 5 - 7 ***as indicated***

Pediatric Reaction / Anaphylaxis Protocol PM 1 ***as indicated***

B 12 Lead ECG Procedure

A IV / IO Procedure ***if indicated***

P Cardiac Monitor

Following Assessment

WHEEZING / Asthma

B **Albuterol Nebulizer 1.25 - 2.5 mg**

STRIDOR / Croup

B **Albuterol Nebulizer 1.25 - 2.5 mg**

A **Epinephrine Nebulizer 1 mg (1:1000) in 2 mL NS** May repeat x 1

Pediatric Airway Protocol(s) 5 - 7 ***as indicated***

A

No response: Consider **Epinephrine 1:1000 0.01 mg / kg IM Maximum 0.3 mg**

Albuterol Nebulizer 1.25 - 2.5 mg +/- Ipratropium 0.5 mg Repeat as needed x 3

P

Methylprednisolone 2 mg / kg IV / IO / IM Maximum 125 mg

Magnesium Sulfate 40 mg/kg IV / IO Infuse over 10 – 20 minutes

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Pediatric Asthma
Respiratory Distress

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- **Pulse oximetry should be monitored continuously in the patient with respiratory distress.**
- **This protocol includes all patients with respiratory distress, Asthma, Reactive Airway Disease, croup, or Bronchospasm. Patients may also have wheezing and respiratory distress with viral upper respiratory tract infections and pneumonia.**
- **Combination nebulizers containing albuterol and ipratropium:**
  Patients may receive more than 3 nebulizer treatments, treatments should continue until improvement. Following 3 combination nebulizers, it is acceptable to continue albuterol solely with subsequent treatments as there is no proven benefit to continual use of ipratropium.
- **Epinephrine:**
- **If allergic reaction or anaphylaxis is suspected, give immediately and repeat until improvement.**
- **If allergic reaction is not suspected, administer with impending respiratory failure and no improvement.**
- **Consider Magnesium Sulfate with impending respiratory failure and no improvement.**
- **Albuterol dosing: ≤ 1 year of age 1.25 mg; 1 – 6 years 1.25 – 2.5 mg; 6 – 14 years 2.5 mg; ≥ 15 years 2.5 – 5 mg.**
- **Consider IV access when Pulse oximetry remains ≤ 92 % after first beta agonist treatment.**
- **Do not force a child into a position, allow them to assume position of comfort. They will protect their airway by their body position.**
- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to beta-agonists. Consider Epinephrine nebulizer if patient < 18 months and not responding to initial beta-agonist treatment.
- Croup typically affects children < 2 years of age. It is viral, possible fever, gradual onset, no drooling is noted.
- Epiglottitis typically affects children > 2 years of age. It is bacterial, with fever, rapid onset, possible stridor, patient wants to sit up to keep airway open, drooling is common. Airway manipulation may worsen the condition.
- In patients using levalbuterol (Xopenex) you may use Albuterol for the first treatment then use the patient's supply for repeat nebulizers or agency's supply.
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency medical director may require Contact of Medical Control prior to administration.

Post-intubation / BIAD Management

Protocols AR 1, 2, 3, 5, and 6 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.

ETT or Blind Insertion Airway Device Successful

NO → Exit to Appropriate Adult or Pediatric Airway Protocol(s) 1 – 7

YES

B 12 Lead ECG Procedure ***as indicated***

A IV / IO Procedure (preferably 2 sites)

Continue Airway Adjuncts
Maintain SpO2 ≥ 90 %
Preferably ≥ 94 %
EtCO2 35 – 45
Ventilate 8 – 10 breaths / minute
May require faster rate
See Pearls

P Cardiac Monitor

P Transport Ventilator Procedure ***If available***

Awakening or Moving after Intubation / BIAD Placement

Evidence of Anxiety / Agitation

NO

YES

P

Ketamine 1.5 – 2.0 mg / kg IV / IO

Fentanyl 50 - 75 mcg IV / IO
Repeat every 5 minutes as needed
Maximum 300 mcg
Pediatric: 1 mcg / kg IV / IO / IN
May repeat **0.5 mcg / kg** every 5 minutes as needed
Maximum 2 mcg / kg
Or
Morphine 4 mg IV / IO
Repeat **2 mg** every 5 minutes as needed
Maximum 10 mg
Pediatric: 0.1 mg / kg IV / IO
Maximum single dose 5 mg
Maximum 10 mg

Midazolam 2 - 2.5 mg IV / IO
Repeat every 3 – 5 minutes as needed
Maximum 10 mg
Pediatric: 0.1 – 0.2 mg / kg IV / IO / IN

Consider long term paralytic
Vecuronium 10 mg (0.1 mg/kg) IV / IO
If needed for patient movement.
Not indicated in Pediatrics

Propofol
Interfacility Transfer Protocol / Policy
If available

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Post-intubation / BIAD Management

Pearls

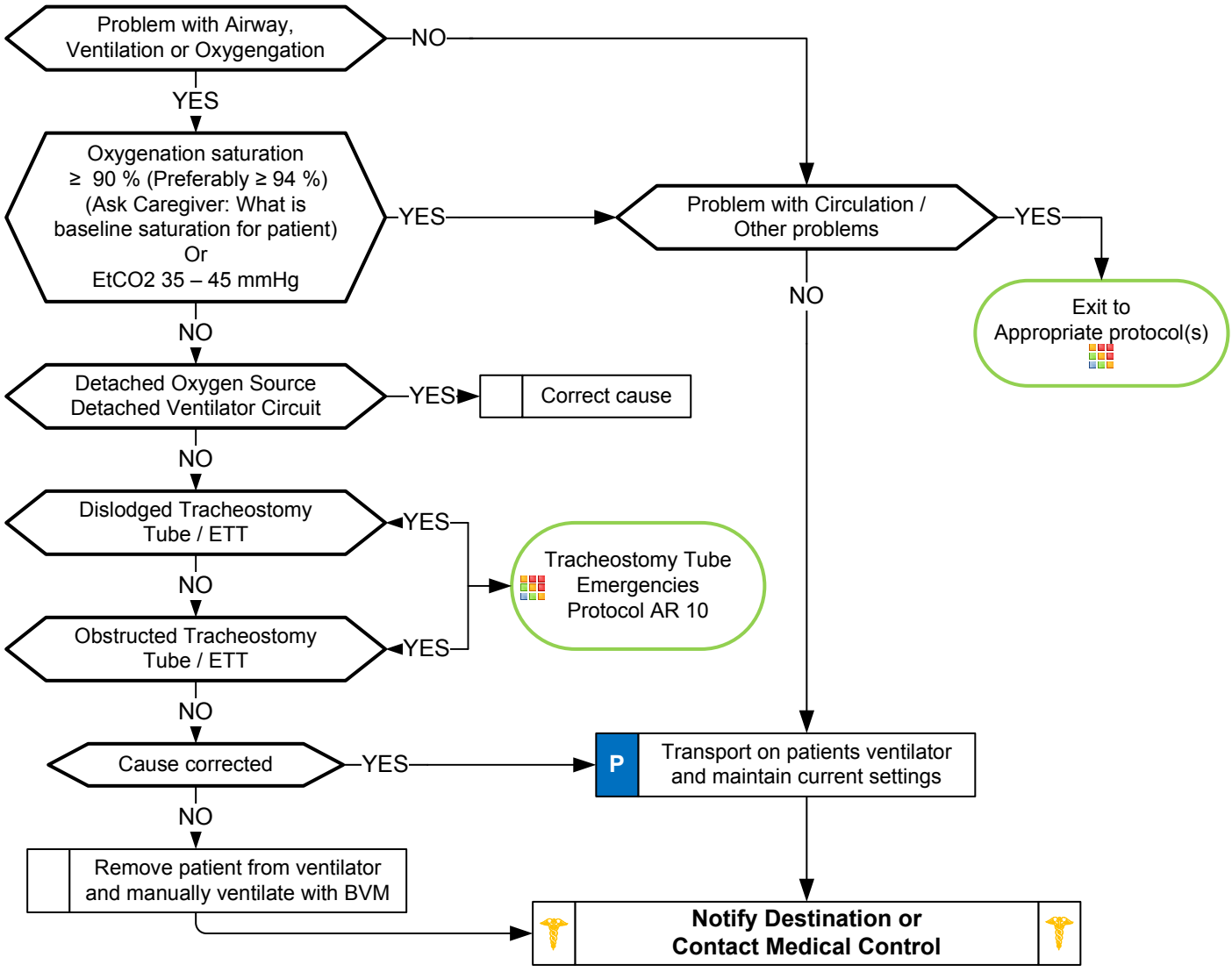
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Patients requiring advanced airways and ventilation commonly experience pain and anxiety.**
- **Unrelieved pain can lead to increased catecholamine release, ischemia, immunosuppression, and prolonged hospitalization.**
- **Ventilated patients cannot communicate pain / anxiety and providers are poor at recognizing pain / anxiety.**
- **Vital signs such has tachycardia and / or hypertension can provide clues to inadequate sedation, however they both are not always reliable indicators of patient's lack of adequate sedation.**
- **Pain must be addressed first, before anxiety. Opioids are typically the first line agents before benzodiazepines. Ketamine is also a reasonable first choice agent.**
- **Ventilator / Ventilation strategies will need to be tailored to individual patient presentations. Medical director can indicate different strategies above.**
- In general ventilation with BVM should cause chest rise. With mechanical ventilation a reasonable tidal volume should be about 6 mL/kg and peak pressures should be < 30 cmH20.
- Continuous pulse oximetry and capnography should be maintained during transport for monitoring.
- Head of bed should be maintained at least 10 – 20 degrees of elevation when possible to decrease aspiration risk.
- With abrupt clinical deterioration, if mechanically ventilated, disconnect from ventilator to assess lung compliance. Search for dislodged ETT or BIAD, obstruction in tubing or airway, pneumothorax, or ETT balloon leak.
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Ventilator Emergencies

History
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchopulmonary dysplasia, muscular dystrophy)

Signs and Symptoms
- Transport requiring maintenance of a mechanical ventilator
- Power or equipment failure at residence

Differential
- Disruption of oxygen source
- Dislodged or obstructed tracheostomy tube
- Detached or disrupted ventilator circuit
- Cardiac arrest
- Increased oxygen requirement / demand
- Ventilator failure



Airway Respiratory Protocol Section

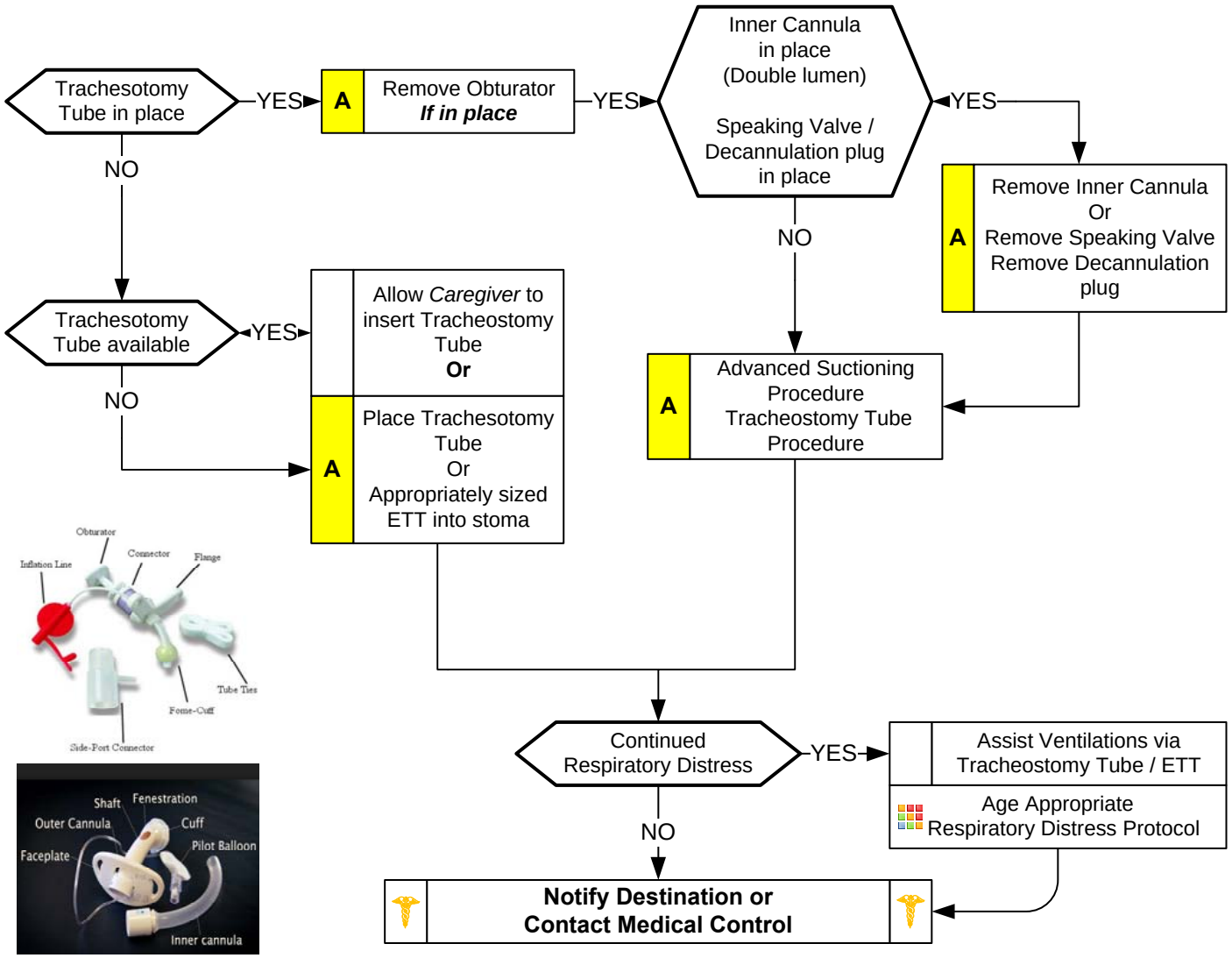
Pearls
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **If using the patient's ventilator bring caregiver knowledgeable in ventilator operation during transport.**
- Always use patient's equipment if available and functioning properly.
- Continuous pulse oximetry and end tidal CO2 monitoring must be utilized during assessment and transport.
- Unable to correct ventilator problem: Remove patient from ventilator and manually ventilate using BVM. Take patient's ventilator to hospital even if not functioning properly.
- Typical alarms: Low Pressure / Apnea: Loose or disconnected circuit, leak in circuit or around tracheostomy site.
  Low Power: Internal battery depleted.
  High Pressure: Plugged / obstructed airway or circuit.
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Tracheostomy Tube Emergencies

History
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (accidental damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchial or pulmonary dysplasia, muscular dystrophy)

Signs and Symptoms
- Nasal flaring
- Chest wall retractions (with or without abnormal breath sounds)
- Attempts to cough
- Copious secretions noted coming out of the tube
- Faint breath sounds on both sides of chest despite significant respiratory effort
- AMS
- Cyanosis

Differential
- Allergic reaction
- Asthma
- Aspiration
- Septicemia
- Foreign body
- Infection
- Congenital heart disease
- Medication or toxin
- Trauma



Airway Respiratory Protocol Section

Pearls
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **Important to ask if patient has undergone laryngectomy. This does not allow mouth/nasal ventilation by covering stoma.**
- Use patients equipment if available and functioning properly.
- Estimate suction catheter size by doubling the inner tracheostomy tube diameter and rounding down.
- Suction depth: Ask family / caregiver. No more than 3 to 6 cm typically. Instill 2 – 3 mL of NS before suctioning.
- Do not suction more than 10 seconds each attempt and pre-oxygenate before and between attempts.
- DO NOT force suction catheter. If unable to pass, then tracheostomy tube should be changed.
- Always deflate tracheal tube cuff before removal. Continual pulse oximetry and EtCO2 monitoring if available.
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Pediatric Asystole / PEA

History
- Events leading to arrest
- Estimated downtime
- SAMPLE
- Existence of terminal illness
- Airway obstruction
- Hypothermia
- Suspected abuse

Signs and Symptoms
- Pulseless
- Apneic
- No electrical activity on ECG
- No heart tones on auscultation

Differential
- Respiratory failure
- Foreign body
- Infection (croup, epiglotitis)
- Congenital heart disease
- See Reversible Causes below

Pediatric Pulseless Arrest Protocol

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES →
Decomposition
Rigor mortis
Dependent lividity
Blunt force trauma
Injury incompatible with life
Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO ↓

Begin Continuous CPR Compressions
Push Hard (1.5 inches Infant / 2 inches in Children)
(≥ 1/3 AP Diameter of Chest)
Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 seconds
15:2 Compression:Ventilation if no Advanced Airway

AED Procedure
if available

Search for Reversible Causes

Blood Glucose Analysis Procedure

P Cardiac Monitor

P Consider Chest Decompression-Needle Procedure

IV / IO Procedure

A **Epinephrine1:10,000**
0.01 mg/kg IV / IO Maximum Single Dose 1mg
Or
Epinephrine 1:1000 0.1 mg / kg ETT Maximum 2.5 mg
Repeat every 3 – 5 minutes

Normal Saline Bolus 20 mL/kg IV / IO
May repeat as needed
Maximum 60 mL/kg

P Consider
Epinephrine 0.1 – 1 mcg / kg / min IV / IO
Or
Dopamine 2 – 20 mcg /kg / min IV / IO
See Pearls

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pediatric Asystole / PEA

Pearls

- **Recommended Exam: Mental Status**
- **Beginning compressions first is recommended in pediatric patients during CPR. However, the majority of pediatric arrests stem from a respiratory insult or hypoxic event. Compressions should be coupled with ventilations.**
- **When 1 provider is present, perform 30 compressions with 2 ventilations.**
- **When 2 providers are present, perform 15 compressions with 2 ventilations.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress ≥ 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **High-Quality CPR:**
  - Make sure chest compressions are being delivered at 100 – 120 / min.
  - Make sure chest compressions are adequate depth for age and body habitus.
  - Make sure you allow full chest recoil with each compression to provide maximum perfusion.
  - Minimize all interruptions in chest compressions to < 10 seconds.
  - Do not hyperventilate, ventilate every 6 seconds only.
- **Use AED or apply ECG monitor / defibrillator as soon as available.**
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with BVM or BIAD. Patient survival is often dependent on proper ventilation and oxygenation / Airway Interventions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach / Pit-Crew Approach assigning responders to predetermined tasks. Refer to optional protocol.
- **Vasopressor agents:**
  - **Dopamine 2 – 20 mcg / kg / min IV / IO**
  - **Epinephrine 0.1 – 1 mcg / kg / min IV / IO**
  - **Norepinephrine 0.1 – 2 mcg / kg / min IV / IO**
  - **Dose Calculation: mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)**
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT (**Maximum 2.5 mg**)

Pediatric Bradycardia With Poor Perfusion

History
- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

Signs and Symptoms
- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered level of consciousness

Differential
- Respiratory failure, Foreign body, Secretions, Infection (croup, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

Suspected Beta-Blocker or Calcium Channel Blocker

Follow Pediatric Toxicology Protocol

Bradycardia
Causing Hypotension / AMS
Poor Perfusion / Shock
Typically HR < 50/min

Pediatric Airway Protocol(s) AR 5, 6
as indicated

Identify underlying cause

Blood Glucose Analysis Procedure

→ Exit to Appropriate Pediatric Protocol(s)

P Cardiac Monitor

Search for reversible causes

IV / IO Procedure

A **Normal Saline Bolus**
20 ml / kg IV / IO
Repeat as needed x 3
Maximum 60 mL / kg

P **Epinephrine 0.1 – 1 mcg / kg / min IV / IO**
Or

Titrate to
SBP ≥ 70 + 2 x Age

Atropine 0.02 mg / kg IV / IO
May repeat x 1
Minimum single dose 0.1 mg
Maximum single dose 0.5 mg

Consider
Cardiac Pacing Procedure

→ **Reversible Causes**

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Bradycardia / Heart Rate < 60 Persists
AND
Poor Perfusion / Shock
Cardiac arrest?

YES → Exit to Pediatric Cardiac Arrest Protocol PC 1, 4, 6

NO

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pediatric Bradycardia With Poor Perfusion

Pearls

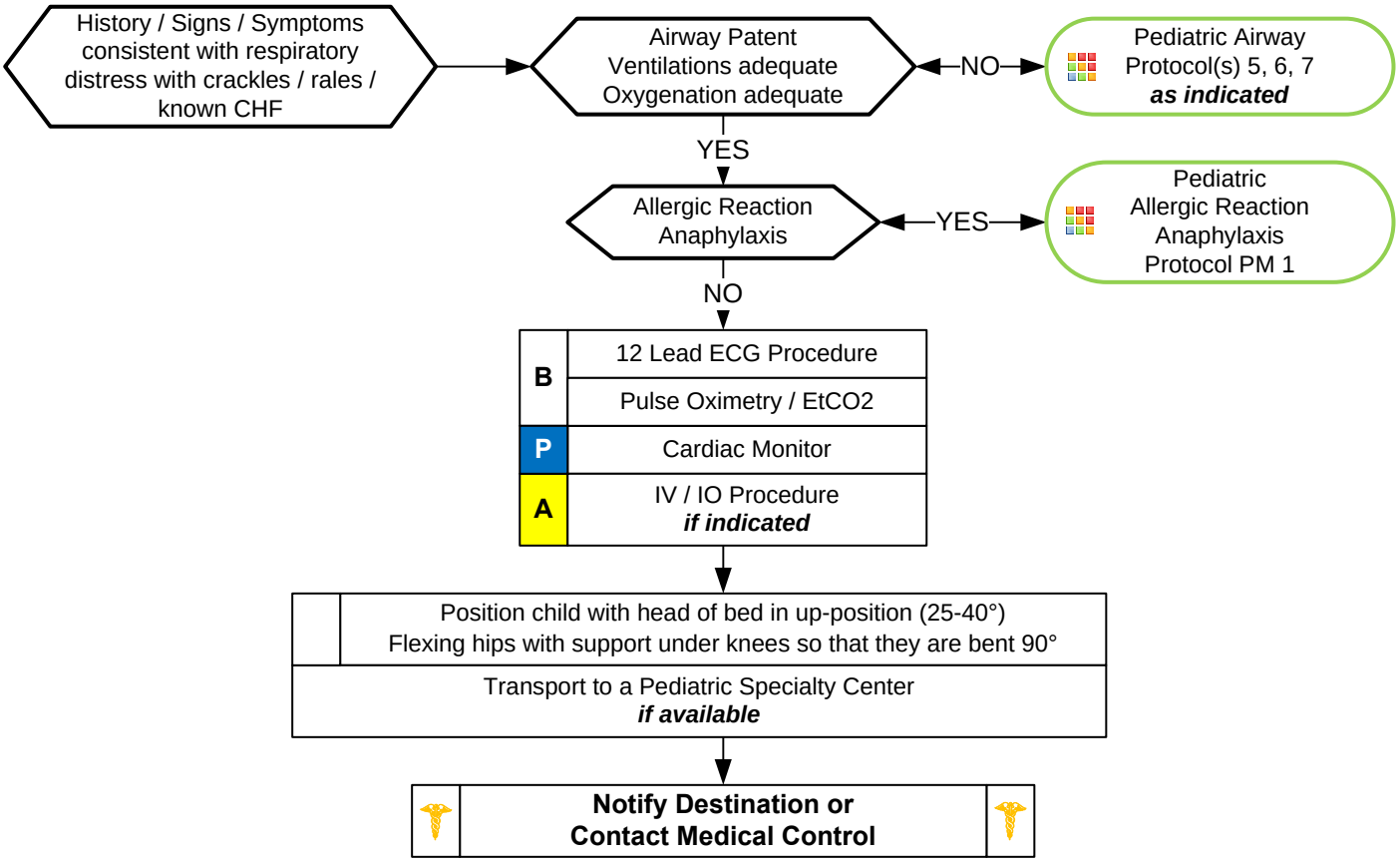
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Use Length-based Resuscitation Tape for drug dosages if applicable.**
- **Ensure patent airway, breathing, and circulation as needed. Administer oxygen. Reassess if bradycardia persists after adequate oxygenation and ventilation.**
- **Bradycardia with adequate pulses, perfusion, and respirations requires no emergency intervention. Monitor and continue evaluation with reassessments.**
- **With HR < 60 / min and poor perfusion despite adequate ventilation and oxygenation, begin CPR immediately.**
- **Epinephrine is first drug choice for persistent, symptomatic bradycardia.**
- **Atropine is second choice, unless there is evidence of increased vagal tone or a primary AV conduction block, then given Atropine first.**
- **Transcutaneous pacing:**
  Indicated if bradycardia is due to complete heart block or other AV blocks which are not responsive to oxygenation, ventilation, chest compressions, or medications. Indicated with known congenital or acquired heart disease.
  Transcutaneous pacing is not indicated for asystole or bradycardia due to postarrest hypoxic / ischemic myocardial insult or respiratory failure.
  Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturers guidelines.
- **Do not delay therapy when bradycardia is evident and no ECG monitor is available.**
- **Vasopressor agents:**
  Dopamine 2 – 20 mcg / kg / min IV / IO
  Epinephrine 0.1 – 1 mcg / kg / min IV / IO
  Norepinephrine 0.1 – 2 mcg / kg / min IV / IO
  Dose Calculation: mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)
- The majority of pediatric arrests are due to airway problems.
- Most maternal medications pass through breast milk to the infant so maintain high-index of suspicion for OD-toxins.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia. Many other agents a child ingests can cause bradycardia, often is a single dose.

Pediatric Pulmonary Edema / CHF

History
- Congenital Heart Disease
- Chronic Lung Disease
- Congestive heart failure
- Past medical history

Signs/Symptoms
- Infant: Respiratory distress, poor feeding, lethargy, weight gain, +/- cyanosis
- Child/Adolescent: Respiratory distress, bilateral rales, apprehension, orthopnea, jugular vein distention (rare), pink, frothy sputum, peripheral edema, diaphoresis, chest pain
- Hypotension, shock

Differential
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure



Pediatric Cardiac Protocol Section

Pearls
- **Recommended exam: Mental status, Respiratory, Cardiac, Skin, Neuro**
- **Contact Medical Control early in the care of the pediatric cardiac patient.**
- **Most children with CHF have a congenital heart defect, obtain a precise past medical history.**
- **Congenital heart disease varies by age:**
  < 1 month: Tetralogy of Fallot, Transposition of the great arteries, Coarctation of the aorta.
  2 – 6 months: Ventricular septal defects (VSD), Atrioseptal defects (ASD).
  Any age: Myocarditis, Pericarditis, SVT, heart blocks.
- **Treatment of Congestive Heart Failure / Pulmonary edema may vary depending on the underlying cause and may include the following with consultation by Medical Control:**
  Morphine Sulfate: 0.1 mg/kg IV / IO. Max single dose 5mg/dose
  Fentanyl: 1 mcg/kg IV / IO. Max single dose 50 mcg.
  Nitroglycerin: Dose determined after consultation of Medical Control.
  Lasix 1 mg/kg IV / IO.
  Agency specific vasopressor.
- Do not assume all wheezing is pulmonary, especially in a cardiac child: avoid albuterol unless strong history of recurrent wheezing secondary to pulmonary etiology (discuss with Medical Control)

Pediatric Cardiac Arrest

History
- Time of arrest
- Medical history
- Medications
- Possibility of foreign body
- Hypothermia

Signs and Symptoms
- Unresponsive
- Cardiac arrest

Differential
- Respiratory failure: Foreign body, Secretions, Infection (croup, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax, cardiac tamponade, pulmonary embolism
- Hypothermia
- Toxin or medication
- Electrolyte abnormalities (Glucose, K)
- Acidosis

Criteria for Death / No Resuscitation
Review DNR / MOST Form
YES → Do not begin resuscitation Follow Deceased Subjects Policy

NO

Newly Born / ≤ 31 days old
YES → Exit to Newly Born Protocol AO 2

NO

≥ 16 years old
YES → Exit to Adult Cardiac Arrest Protocol AC 3

NO

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Begin Continuous CPR Compressions
Push Hard (1.5 inches Infant / 2 inches in Children)
(≥ 1/3 AP Diameter of Chest)
Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 seconds
15:2 Compression:Ventilation if no Advanced Airway

Defibrillation Automated
if available

ALS Available
NO → Shockable Rhythm
NO → Continue CPR 5 Cycles / 2 Minutes Repeat and reassess
Pediatric Airway Protocol(s) 5, 6
YES → Defibrillation Automated

YES → Shockable Rhythm
NO → Pediatric Asystole / PEA Protocol PC 1
Pediatric Airway Protocol(s) 5, 6
YES → Pediatric VF / VT Protocol PC 6
Pediatric Tachycardia Protocol PC 5
Pediatric Airway Protocol(s) 5, 6

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pediatric Cardiac Arrest

Pearls

- **Recommended Exam: Mental Status**
- **Beginning compressions first is recommended in pediatric patients during CPR. However, the majority of pediatric arrests stem from a respiratory insult or hypoxic event. Compressions should be coupled with ventilations.**
- **When 1 provider is present, perform 30 compressions with 2 ventilations.**
- **When 2 providers are present, perform 15 compressions with 2 ventilations.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress ≥ 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Defibrillation: First defibrillation is 2 J/kg, second defibrillation is 4 J/kg, subsequent shocks ≥ 4 J/kg (Maximum 10 J/kg or adult dose)**
- **End Tidal CO2 (EtCO2)**

  If EtCO2 is < 10 mmHg, improve chest compressions.
  If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**

  Maternal Arrest - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.

  Renal Dialysis / Renal Failure - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.

  Opioid Overdose - Naloxone cannot be recommended in opioid-associated cardiac arrest. If suspected, attention to airway, oxygenation, and ventilation increase in importance. Naloxone is not associated with improved outcomes in cardiac arrest.

  Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:**

  Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach / Pit-Crew Approach assigning responders to predetermined tasks. Refer to optional protocol.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT (**Maximum 2.5 mg**)

Pediatric Tachycardia

History
- Past medical history
- Medications or Toxic Ingestion (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Drugs (nicotine, cocaine)
- Congenital Heart Disease
- Respiratory Distress
- Syncope or Near Syncope

Signs and Symptoms
- Heart Rate: Child > 180/bpm
  Infant > 220/bpm
- Pale or Cyanosis
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered Level of Consciousness
- Pulmonary Congestion
- Syncope

Differential
- Heart disease (Congenital)
- Hypo / Hyperthermia
- Hypovolemia or Anemia
- Electrolyte imbalance
- Anxiety / Pain / Emotional stress
- Fever / Infection / Sepsis
- Hypoxia, Hypoglycemia
- Medication / Toxin / Drugs (see HX)
- Pulmonary embolus
- Trauma, Tension Pneumothorax

Single lead ECG able to diagnose and treat arrhythmia

12 Lead ECG not necessary to diagnose and treat, but preferred when patient is stable.

Unstable / Serious Signs and Symptoms
HR Typically > 180 Child
HR Typically > 220 Infant

YES → **P** Cardioversion Procedure
0.5 – 1 J / kg
Repeat and increase to **2 J / Kg**
May increase to **4 J / Kg**
Or adult maximum

P Consider sedation
Do NOT delay cardioversion
Midazolam 0.1 – 0.2 mg / kg IV / IO / IN
May repeat if needed
Maximum Single Dose 2 mg
Maximum Total Dose 5 mg

NO

B 12 Lead ECG Procedure
A IV / IO Procedure
P Cardiac Monitor

QRS ≥ 0.09 seconds
- NO → Probable Sinus Tachycardia → Identify and Treat Underlying Cause → Exit to Appropriate Protocol(s)
- NO → Probable SVT → **P** Vagal Maneuvers
  Adenosine
  0.1 mg / kg IV / IO
  Maximum 6 mg
  May repeat
  Adenosine
  0.2 mg / kg IV / IO
  Maximum 12 mg
- YES → Possible VT → Unstable Hypotension / AMS / Poor perfusion
  - YES → **P** Cardioversion Procedure (see above)
  - NO → **P**
    Adenosine
    0.1 mg / kg IV / IO
    Maximum 6 mg
    May repeat
    Adenosine
    0.2 mg / kg IV / IO
    Maximum 12 mg

    Only if rhythm is regular and QRS are monomorphic

B Rhythm Converts
12 Lead ECG Procedure

Notify Destination or Contact Medical Control

AT ANY TIME

Pulseless

Go to Pediatric Pulseless Arrest Protocol

Pediatric Cardiac Protocol Section

Pediatric Tachycardia

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Serious Signs and Symptoms:**
  - **Respiratory distress / failure.**
  - **Signs of shock / poor perfusion with or without hypotension.**
  - **AMS**
  - **Sudden collapse with rapid, weak pulse**
- **Narrow Complex Tachycardia (≤ 0.09 seconds):**
  - Sinus tachycardia: P waves present. Variable R-R waves. Infants usually < 220 beats / minute. Children usually < 180 beats / minute.
  - SVT: > 90 % of children with SVT will have a narrow QRS (≤0.09 seconds.) P waves absent or abnormal. R-R waves not variable. Usually abrupt onset. Infants usually > 220 beats / minute. Children usually > 180 beats / minute.
  - Atrial Flutter / Fibrillation
- **Wide Complex Tachycardia (≥ 0.09 seconds):**
  - SVT with aberrancy.
  - VT: Uncommon in children. Rates may vary from near normal to > 200 / minute. Most children with VT have underlying heart disease / cardiac surgery / long QT syndrome / cardiomyopathy.
  - **Amiodarone 5 mg / kg over 20 – 60 minutes or Procainamide 15 mg / kg over 30 – 60 minutes IV / IO** are recommended agents. They should not be administered together. Consultation with Medical Control is advised when these agents are considered.
- **Torsades de Pointes / Polymorphic (multiple shaped) Tachycardia:**
  - Rate is typically 150 to 250 beats / minute.
  - Associated with long QT syndrome, hypomagnesaemia, hypokalemia, many cardiac drugs.
  - May quickly deteriorate to VT.
  - Administer **Magnesium Sulfate 40 mg / kg IV / IO over 10 minutes**. Cardiac arrest given over 2 minutes.
- **Vagal Maneuvers:**
  - Breath holding. Blowing a glove into a balloon. Have child blow out “birthday candles” or through an obstructed straw. Infants: May put a bag of ice water over the upper half of the face careful not to occlude the airway.
- Separating the child from the caregiver may worsen the child's clinical condition.
- Pediatric paddles should be used in children < 10 kg or Broselow-Luten color Purple if available.
- Monitor for respiratory depression and hypotension associated if Diazepam, Lorazepam, or Midazolam is used.
- Continuous pulse oximetry is required for all SVT Patients if available.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Generally, the maximum sinus tachycardia rate is 220 – the patient’s age in years.

Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia

History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia

Signs and Symptoms
- Unresponsive
- Cardiac Arrest

Differential
- Respiratory failure / Airway obstruction
- Hyper / hypokalemia, Hypovolemia
- Hypothermia, Hypoglycemia, Acidosis
- Tension pneumothorax, Tamponade
- Toxin or medication
- Thrombosis: Coronary / Pulmonary Embolism
- Congenital heart disease

Pediatric Pulseless Arrest Protocol

Begin Continuous CPR Compressions
Push Hard (1.5 inches Infant / 2 inches in Children)
(≥ 1/3 AP Diameter of Chest)
(Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 seconds
15:2 Compression:Ventilation if no Advanced Airway

Defibrillation Automated
if available

IV / IO Procedure

A

Epinephrine1:10,000
0.01 mg/kg IV / IO Maximum 1mg
Or
Epinephrine 1:1000 0.1 mg / kg ETT
Maximum 2.5 mg
Repeat every 3 – 5 minutes

P Defibrillation Manual Procedure 2 J / Kg

<u>If Rhythm Refractory</u>
Continue CPR and give Agency specific Anti-arrhythmic(s). Continue epinephrine during compressions.
Continue CPR up to point where you are ready to defibrillate with device charged.
Repeat pattern during resuscitation.

P

Amiodarone
See length based color coded resuscitation tape for dosing
(5 mg/kg – max 300mg)
Or
Lidocaine 1.5 mg/kg

Defibrillation Manual Procedure 4 J / Kg
Subsequent shocks ≥ 4 J / kg
Maximum 10 J / kg or adult dose

Consider
Defibrillation Dual Sequential Manual Procedure
if available and rhythm refractory

Notify Destination or Contact Medical Control

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Persistent VF / VT
Or
<u>Torsades de Points</u>

Magnesium Sulfate
40 mg/kg IV / IO over 1 – 2 minutes
May repeat every 5 minutes
Maximum 2 g

Pediatric Cardiac Protocol Section

Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Pearls

- **Recommended Exam: Mental Status**
- **Beginning compressions first is recommended in pediatric patients during CPR. However, the majority of pediatric arrests stem from a respiratory insult or hypoxic event. Compressions should be coupled with ventilations.**
- **When 1 provider is present, perform 30 compressions with 2 ventilations.**
- **When 2 providers are present, perform 15 compressions with 2 ventilations.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress ≥ 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Defibrillation: First defibrillation is 2 J/kg, second defibrillation is 4 J/kg, subsequent shocks ≥ 4 J/kg (Maximum 10 J/kg or adult dose)**
- **End Tidal CO2 (EtCO2)**
  If EtCO2 is < 10 mmHg, improve chest compressions.
  If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Antiarrhythmic agents:**
  Adenosine: First dose: 0.1 mg / kg (Maximum 6 mg) Second dose: 0.2 mg / kg (Maximum 12 mg)
  Amiodarone 5 mg / kg IV / IO (single dose Maximum 300 mg). May repeat x 2 to a Maximum of 15 mg / kg.
  Lidocaine 1 mg / kg IV / IO. Infusion 20 – 50 mcg / kg / min. If infusion is initiate > 15 minutes from first bolus, repeat 1 mg / kg bolus.
  Magnesium Sulfate 40 mg / kg IV / IO over 10 – 20 minutes. In Torsades de pointes give over 1 – 2 minutes. Maximum 2 g.
  Procainamide 15 mg / kg IV / IO over 30 – 60 minutes. Monitor for increased QRS and increased QT.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach / Pit-Crew Approach assigning responders to predetermined tasks. Refer to optional protocol.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT (**Maximum 2.5 mg**)

Pediatric Post Resuscitation

History
- Respiratory arrest
- Cardiac arrest

Signs/Symptoms
- Return of pulse

Differential
- Continue to address specific differentials associated with the original dysrhythmia

	Pediatric Airway Protocol(s) AR 5 - 7 ***as needed***
	Monitor Vital Signs / Reassess
B	Blood Glucose Analysis Procedure
B	**Optimize Ventilation and Oxygenation** • Maintain SpO2 ≥ 90% • Preferably SpO2 ≥ 94% • Advanced airway if indicated • ETCO2 ideally 35 – 45 mm Hg • Respiratory Rate 8 – 10 • Remove Impedence Threshold Device DO NOT HYPERVENTILATE
B	12 Lead ECG Procedure
A	IV / IO Procedure
P	Cardiac Monitor
	Pediatric Diabetic Protocol PM 2 ***if indicated***
	Pediatric Hypotension / Shock Protocol PM 3 ***if indicated***
	Pediatric Bradycardia Protocol PC 2 ***if indicated***
	Pediatric Tachycardia Protocol PC 5 ***if indicated***

Hypotension Age Based

0 – 31 Days
< 60 mmHg

1 Month to 1 Year
< 70 mmHg

> than 1 Year
< 70 + (2 x age) mmHg

Antiarrhythmic Medication Given During Arrest

YES

	Continue Antiarrhythmic Utilized Refer to Appropriate Pediatric Arrhythmia Protocol
P	Amiodarone or Lidocaine See length based color coded resuscitation tape for dose. Anti-arrythmic drips are not always necessary post ROSC

NO

Arrhythmias are common and usually self limiting after ROSC

If Arrhythmia Persists follow Rhythm Appropriate Protocol

Post-intubation / BIAD Management Protocol AR 8

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pediatric Post Resuscitation

Pearls

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- **Goals of care are to preserve neurologic function, prevent secondary organ damage, treat the underlying cause of illness, and optimize prehospital care. Frequent reassessment is necessary.**
- **Hyperventilation is a significant cause of hypotension / recurrence of cardiac arrest in post resuscitation phase and must be avoided.**
- **Target oxygenation to ≥ 94 %. 100 % FiO2 is not necessary, titrate oxygen accordingly.**
- **EtCO2 should be continually monitored with advanced airway in place.**
- **Administer resuscitation fluids and vasopressor agents to maintain SBP at targets listed on page 1. This table represents minimal SBP targets.**
- **Targeted Temperature Management is recommended in pediatrics, but prehospital use is not associated with improved outcomes. Transport to facility capable of intensive pediatric care.**
- **<u>Antiarrhythmic agents:</u>**
  - **Adenosine: First dose: 0.1 mg / kg (Maximum 6 mg) Second dose: 0.2 mg / kg (Maximum 12 mg)**
  - **Amiodarone 5 mg / kg IV / IO (single dose Maximum 300 mg). May repeat x 2 to a Maximum of 15 mg / kg.**
  - **Lidocaine 1 mg / kg IV / IO. Infusion 20 – 50 mcg / kg / min. If infusion is initiated > 15 minutes from first bolus, repeat 0.5 mg / kg bolus.**
  - **Magnesium Sulfate 40 mg / kg IV / IO over 10 – 20 minutes. In Torsades de pointes give over 1 – 2 minutes. Maximum 2 g.**
  - **Procainamide 15 mg / kg IV / IO over 30 – 60 minutes. Monitor for increased QRS and increased QT.**
- **<u>Vasopressor agents:</u>**
  - **Dopamine 2 – 20 mcg / kg / min IV / IO**
  - **Epinephrine 0.1 – 1 mcg / kg / min IV / IO**
  - **Norepinephrine 0.1 – 2 mcg / kg / min IV / IO**
  - **Dose Calculation: mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)**
- If pediatric weight is known, use in drug and fluid calculations. Use actual body weight for calculating initial medication dosages. If unknown then use a body length tape system.
- Appropriate post-resuscitation management may best be planned in consultation with medical control.

Suspected Viral Hemorrhagic Fever
Ebola

EMS Dispatch Center

1. Use Emerging Infectious Disease (EID) Surveillance Tool with the following chief complaints:
   - **Typical Flu-Like Symptoms**
     and/or
   - **Unexpected Bleeding**
     (not trauma or isolated nose bleed related)

2. Use EID Card (or equivalent) with the following protocols (or equivalent)
   - EMD 6 Breathing Problem
   - EMD 10 Chest Pain
   - EMD 18 Headache
   - EMD 21 Hemorrhage (medical)
   - EMD 26 Sick Person

3. Ask the following:
   - In the past 21 days have you been to Africa or been exposed to someone who has?
   - If YES:
   - Do you have a fever?

Evolving Protocol:
Protocol subject to change at any time dependent on changing outbreak locations.

Monitor for protocol updates.

Viral Hemorrhagic Fevers:
Ebola is one of many.

YES → **DO NOT DISPATCH FIRST RESPONDERS**

Dispatch EMS Unit only
Discretely notify EMS Supervisor or command staff

NO

EMS

Do not rely solely on EMD personnel to identify a potential viral hemorrhagic fever patient – constrained by time and caller information

Obtain a travel history / exposure history and assess for clinical signs and symptoms

EMS Immediate Concern

1. Traveler from area with known VHR (Ebola) with or without symptoms
2. Traveler from Sierra Leone, Guinea, or Liberia within past 21 days

AND

Fever, Headache	Joint and Muscle aches	Weakness, Fatigue
Vomiting and/or Diarrhea	Abdominal Pain	Anorexia
Bleeding		

NO → Exit to Appropriate Protocol(s)

YES

EMS Personal Protective Equipment → Refer to page 2
Place surgical mask on patient
Use Non-rebreather mask if Oxygen Needed
Donning and Doffing Guidelines

NO Routine Aerosol Generating Procedures → Avoid aerosol generating procedures unless medically necessary
NIPPV / Nebulizer therapy / Intubation / BIAD / Suctioning

No Routine IV or IO Lines → Avoid routine IV or IO access unless medically necessary
If IV / IO necessary:
Stop vehicle to lessen exposure risk

EMS Personnel / Equipment / Transport Unit Requires Decontamination → Refer to Page 3

Notify Destination as soon and as discretely as possible
DO NOT ENTER facility with patient until instructed
Follow entry directions from hospital staff

Special Circumstances Section

Suspected Viral Hemorrhagic Fever
Ebola

PARTICULAR ATTENTION MUST BE PAID TO PROTECTING MUCOUS MEMBRANES OF THE EYES, NOSE, and MOUTH FROM SPLASHES OF INFECTIOUS MATERIAL OR SELF INOCULATION FROM SOILED PPE / GLOVES.
THERE SHOULD BE NO EXPOSED SKIN

DONNING PPE: BEFORE you enter the patient area.

Recommended PPE

PAPR: A PAPR with a full face shield, helmet, or headpiece. Any reusable helmet or headpiece must be covered with a single-use (disposable) hood that extends to the shoulders and fully covers the neck and is compatible with the selected PAPR.

N95 Respirator: Single-use (disposable) N95 respirator in combination with single-use (disposable) surgical hood extending to shoulders and single-use (disposable) full face shield. If N95 respirators are used instead of PAPRs, careful observation is required to ensure healthcare workers are not inadvertently touching their faces under the face shield during patient care.

Single-use (disposable) fluid-resistant or impermeable gown that extends to at least mid-calf or coverall without integrated hood. Coveralls with or without integrated socks are acceptable.

Single-use (disposable) nitrile examination gloves with extended cuffs. Two pairs of gloves should be worn. At a minimum, outer gloves should have extended cuffs.

Single-use (disposable), fluid-resistant or impermeable boot covers that extend to at least mid-calf or single-use (disposable) shoe covers. Boot and shoe covers should allow for ease of movement and not present a slip hazard to the worker.

Single-use (disposable) fluid-resistant or impermeable shoe covers are acceptable only if they will be used in combination with a coverall with integrated socks.

Single-use (disposable), fluid-resistant or impermeable apron that covers the torso to the level of the mid-calf should be used if Ebola patients have vomiting or diarrhea. An apron provides additional protection against exposure of the front of the body to body fluids or excrement. If a PAPR will be worn, consider selecting an apron that ties behind the neck to facilitate easier removal during the doffing procedure

DOFFING PPE: OUTSIDE OF PPE IS CONTAMINATED! DO NOT TOUCH

1) PPE must be carefully removed without contaminating one's eyes, mucous membranes, or clothing with potentially infectious materials.

Use great care while doffing your PPE so as not to contaminate yourself (e.g. Do not remove your N-95 facemask or eye protection BEFORE you remove your gown). There should be a dedicated monitor to observe donning and doffing of PPE. It is very easy for personnel to contaminate themselves when doffing. A dedicated monitor should observe doffing to insure it is done correctly. Follow CDC guidance on doffing.

2) PPE must be double bagged and placed into a regulated medical waste container and disposed of in an appropriate location.
3) Appropriate PPE must be worn while decontaminating / disinfecting EMS equipment or unit.
3) Re-useable PPE should be cleaned and disinfected according to the manufacturer's reprocessing instructions.

Hand Hygiene should be performed by washing with soap and water with hand friction for a minimum of 20 seconds. Alcohol-based hand rubs may be used if soap and water are not available.

EVEN IF AN ALCOHOL-BASED HAND RUB IS USED, WASH HANDS WITH SOAP AND WATER AS SOON AS FEASIBLE.

THE USE OF GLOVES IS NOT A SUBSTITUTE FOR HAND WASHING WITH SOAP & WATER

For any provider exposure or contamination contact occupational health.

If the patient is being transported via stretcher then a disposable sheet can be placed over them.

Special Circumstances Section

Pearls

- **Transmission to another individual is the greatest after a patient develops fever. Once there is fever, the viral load in the bodily fluids appears to be very high and thus a heightened level of PPE is required.**
- **Patient contact precautions are the most important consideration.**
- **Incubation period 2-21 days**
- **Ebola must be taken seriously; however using your training, protocols, procedures and proper Personal Protective Equipment (PPE), patients can be cared for safely.**
- When an infection does occur in humans, the virus can be spread in several ways to others. The virus is spread through direct contact (through broken skin or mucous membranes) with a sick person's blood or body fluids (urine, saliva, feces, vomit, and semen) objects (such as needles) that have been contaminated with infected body fluids.
- Limit the use of needles and other sharps as much as possible. All needles and sharps should be handled with extreme care and disposed in puncture-proof, sealed containers. Safety devices must be employed immediately after use.
- Ebola Information: **For a complete review of Ebola go to:**
  http://www.cdc.gov/vhf/ebola/index.html
  http://www.cdc.gov/vhf/ebola/hcp/interim-guidance-emergency-medical-services-systems-911-public-safety-answering- points-management-patients-known-suspected-united-states.html

Revised locally 12/08/2017

Suspected Viral Hemorrhagic Fever
Ebola

EMS Personal
Requires Decontamination

If EMS personnel are exposured to blood, bodily fluids, secretions, or excretions from a patient with suspected or confirmed Ebola should immediately:

1) Stop working and wash the affected skin surfaces with soap and water.
2) Mucous membranes (e.g., conjunctiva) should be irrigated with a large amount of water or eyewash solution;

EMS Equipment / Transport Unit
Requires Decontamination

1) EMS personnel performing decontamination / disinfection should wear recommended PPE
   When performing Decontamination EMS Personnel MUST wear appropriate PPE, which includes:
   - •Gloves (Double glove)
   - •Fluid resistant (impervious) Tyvek Like Full length (Coveralls)
   - •Eye protection (Goggles)
   - •N-95 face mask
   - •Fluid resistant (impervious)-Head covers
   - •Fluid resistant (impervious)-Shoe / Boot covers
2) Face protection (N-95 facemask with goggles) should be worn since tasks such as liquid waste disposal can generate splashes.
3) Patient-care surfaces (including stretchers, railings, medical equipment control panels, and adjacent flooring, walls and work surfaces) are likely to become contaminated and should be decontaminated and disinfected after transport.
4) A blood spill or spill of other body fluid or substance (e.g., feces or vomit) should be managed through removal of bulk spill matter, cleaning the site, and then disinfecting the site. For large spills, a chemical disinfectant with sufficient potency is needed to overcome the tendency of proteins in blood and other body substances to neutralize the disinfectant's active ingredient. An EPA-registered hospital disinfectant with label claims for viruses that share some technical similarities to Ebola (such as, norovirus, rotavirus, adenovirus, poliovirus) and instructions for cleaning and decontaminating surfaces or objects soiled with blood or body fluids should be used according to those instructions.
   (Alternatively, a 1:10 dilution of household bleach (final working concentration of 500 parts per million or 0. 5% hypochlorite solution) that is prepared fresh daily (i.e., within 12 hours) can be used to treat the spill before covering with absorbent material and wiping up. After the bulk waste is wiped up, the surface should be disinfected as described in the section above).
5) Contaminated reusable patient care equipment should be placed in biohazard bags (double-bagged) and labeled for decontamination and disinfection.
6) Reusable equipment should be cleaned and disinfected according to manufacturer's instructions by appropriately trained personnel wearing correct PPE.
7) Avoid contamination of reusable porous surfaces that cannot be made single use. Use only a mattress and pillow with plastic or other covering that fluids cannot get through.
8) To reduce exposure, all potentially contaminated textiles (cloth products) should be discarded. This includes non-fluid-impermeable pillows or mattresses. They should be considered regulated medical waste and placed in biohazard red bags. They must be double-bagged prior to being placed into regulated medical waste containers.

Pearls

- Ebola Information: **For a complete review of Ebola EMS Vehicle Disinfection go to:**
  http://www.cdc.gov/vhf/ebola/hcp/interim-guidance-emergency-medical-services-systems-911-public-safety-answering-points-management-patients-known-suspected-united-states.html

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Suspected Viral Hemorrhagic Fever
Ebola

Decedent Known or suspected carrier of HVF / Ebola Requires Transportation

Only personnel trained in handling infected human remains, and wearing full PPE, should touch, or move any Ebola-infected remains.
Handling human remains should be kept to a minimum.

Donning / Doffing PPE

PPE should be in place **BEFORE** contact with the body

1) Prior to contact with body, postmortem care personnel must wear PPE consisting of: surgical scrub suit, surgical cap, impervious Tyvex-Coveralls, eye protection (e.g., face shield, goggles), facemask, shoe covers, and double surgical gloves.

2) Additional PPE (leg coverings,) might be required in certain situations (e.g., copious amounts of blood, vomit, feces, or other body fluids that can contaminate the environment).

PPE should be removed immediately after and discarded as regulated medical waste.

1) Use caution when removing PPE as to avoid contaminating the wearer.

2) Hand hygiene (washing your hands thoroughly with soap and water or an alcohol based hand rub) should be performed immediately following the removal of PPE. If hands are visibly soiled, use soap and water.

Preparation of Body Prior to Transport

1) At the site of death, the body should be wrapped in a plastic shroud. Wrapping of the body should be done in a way that prevents contamination of the outside of the shroud.
2) Change your gown or gloves if they become heavily contaminated with blood or body fluids.
3) Leave any intravenous lines or endotracheal tubes that may be present in place.
4) Avoid washing or cleaning the body.
5) After wrapping, the body should be immediately placed in a leak-proof plastic bag not less than 150 µm thick and zippered closed The bagged body should then be placed in another leak-proof plastic bag not less than 150 µm thick and zippered closed before being transported to the morgue.

Surface Decontamination

1) Prior to transport to the morgue, perform surface decontamination of the corpse-containing body bags by removing visible soil on outer bag surfaces with EPA-registered disinfectants which can kill a wide range of viruses.
2) Follow the product's label instructions. Once the visible soil has been removed, reapply the disinfectant to the entire bag surface and allow to air dry.
3) Following the removal of the body, the patient room should be cleaned and disinfected.
4) Reusable equipment should be cleaned and disinfected according to standard procedures.

Transportation of VHV / Ebola Remains

PPE is required for individuals driving or riding in a vehicle carrying human remains. DO NOT handle the remains of a suspected / confirmed case of Ebola The remains must be safely contained in a body bag where the outer surface of the body bag has been disinfected prior to the transport.

Pearls

- Ebola Information: **For a complete review of Handling Remains of Ebola Infected Patients go to:**
  http://www.cdc.gov/vhf/ebola/hcp/guidance-safe-handling-human-remains-ebola-patients-us-hospitals-mortuaries.html

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Scene Rehabilitation: General

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.

Initial Process
1. Personnel logged into General Rehabilitation Section
2. VS Assessed / Recorded (If HR > 110 then obtain Temp)
   Carbon Monoxide monitoring if indicated
3. Personnel assessed for signs / symptoms
4. Remove PPE, Body Armor, Haz-Mat Suits, Turnout Gear, Other equipment as indicated

Significant Injury
Cardiac Complaint: Signs / Symptoms
Respiratory Complaint: Serious Signs / Symptoms
Respiratory Rate < 8 or > 40
Systolic Blood Pressure ≤ 80

YES → Exit to Scene Rehabilitation Responder Protocol

NO

Heat or Cold stress

YES → **HEAT STRESS**

Active Cooling Measures
Forearm immersion, cool shirts, cool mist fans etc.
Rest 10 – 20 Minutes

Rehydration Techniques
12 – 32 oz Oral Fluid over 20 minutes
Oral Rehydration may occur along with Active Cooling Measures
Firefighters should consume 8 ounces of fluid between SCBA change-out

YES → **COLD STRESS**

Active Warming Measures
Dry responder, place in warm area
Hot packs to axilla and / or groin
Rest 10 – 20 minutes

Rehydration Techniques
12 – 32 oz Oral Fluid over 20 minutes
Oral Rehydration may occur along with Active Warming Measures
Firefighters should consume 8 ounces of fluid between SCBA change-out

NO → Reassess responder after 20 Minutes in General Rehabilitation Section
Reassess VS

HR ≥ 110 → YES → Responder Cannot Wear Protective Gear
Extend Rehabilitation Time Until VS Improve

HR ≥ 110 → NO → Temp ≥ 100.6 → YES → Extend Rehabilitation Time Until VS Improve

Temp ≥ 100.6 → NO → Discharge Responder from General Rehabilitation Section
Reports for Reassignment

VITAL SIGN CAVEATS

Blood Pressure:
Prone to inaccuracy on scenes. Must be interpreted in context.

Firefighters have elevated blood pressure due to physical exertion and is not typically pathologic.

Firefighters with Systolic BP ≥ 160 or Diastolic BP ≥ 100 may need extended rehabilitation. However this does not necessarily prevent them from returning to duty.

Temperature:
Firefighters may have increased temperature during rehabilitation.

Special Operations Section

Scene Rehabilitation: General

Pearls

- **Rehabilitation officer has full authority in deciding when responders may return to duty and may adjust rest / rehabilitation time frames depending on existing conditions.**
- **Rehabilitation goals:**
  - **Relief from climatic conditions.**
  - **Rest, recovery, and hydration prior to incident, during, and following incident.**
  - **Active and / or passive cooling or warming as needed for incident type and climate conditions.**
- **May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.**
- **Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.**
- **General indications for rehabilitation:**
  - 20-minute rehabilitation following use of a second 30-minute SCBA, 45-minute SCBA or single 60-minute SCBA cylinder.
  - 20-minute rehabilitation following 40 minutes of intense work without SCBA.
- **General work-rest cycles:**
  - 10-minute self-rehabilitation following use of one 30-minute SCBA cylinder or performing 20 minutes of intense work without SCBA.
- **Serious signs / symptoms:**
  - Chest pain, dizziness, dyspnea, weakness, nausea, or headache.
  - Symptoms of heat stress (cramps) or cold stress.
  - Changes in gait, speech, or behavior.
  - Altered Mental Status.
  - Abnormal Vital Signs per agency SOP or Policy / Procedure.
- **Rehabilitation Section:**
  - Integral function within the Incident Management System.
  - Establish section such that it provides shelter / shade, privacy and freedom from smoke or other hazards
  - Large enough to accommodate expected number of personnel.
  - Separate area to remove PPE.
  - Accessible to EMS transport units and water supply.
  - Away from media agencies and spectators / bystanders.

Scene Rehabilitation: Responder

Remove:
PPE
Body Armor
Chemical Suits
SCBA
Turnout Gear
Other equipment as indicated

Continue:
Heat and Cold Stress treatment techniques from General Rehab Section

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.

NFPA Age Predicted 85 % Maximum Heart Rate	
20 - 25	170
26 - 30	165
31 - 35	160
36 - 40	155
41 - 45	152
46 - 50	148
51 -55	140
55 - 60	136
61 - 65	132

Initial Process
1. Personnel logged into Responder Rehabilitation Section
2. VS Assessed and Recorded / Orthostatic Vital Signs
3. Pulse oximetry and SPCO (if available)
4. Personnel assessed for signs / symptoms

Use in conjunction with General Rehabilitation Protocol

20 Minute Rest Period

Pulse Rate > 85 % NFPA Age Predicted Maximum — YES → **A**

NO

Systolic BP ≥ 160 Or Diastolic BP ≥ 100 — YES

NO

Respirations < 8 or > 40 — YES

NO

Pulse oximetry < 90 % SPCO > 10 % — YES

NO

Temperature ≥ 100.6 — YES

NO

Discharge Responder from General Rehabilitation Section

Reports for Reassignment

A
Normal Saline Bolus
500 mL IV / IO
Maximum 2 L
Titrate to HR ≤ 100
An
SBP ≥ 100 mmHg

No improvement after 30 minutes of additional rehabilitation

Mandatory Rest Period
Rehydration is Most Important
Re-evaluate in 10 minutes

Notify Destination or Contact Medical Control

Special Operations Section

Pearls

- **Rehabilitation officer has full authority in deciding when responders may return to duty.**
- **Utilized when responder is not appropriate for General Rehabilitation Protocol.**
- **May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.**
- **Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.**
- Rehabilitation Section is an integral function within the Incident Management System.
- Establish section such that it provides shelter, privacy and freedom from smoke or other hazards.

Blast Injury / Incident

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential
- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Nature of Device: Agent / Amount. Industrial Explosion. Terrorist Incident. Improvised Explosive Device.
Method of Delivery: Incendiary / Explosive
Nature of Environment: Open / Closed.
Distance from Device: Intervening protective barrier. Other environmental hazards,
Evaluate for: Blunt Trauma / Crush Injury / Compartment Syndrome / Traumatic Brain Injury / Concussion / Tympanic Membrane Rupture / Abdominal hemorrhage or Evisceration, Blast Lung Injury and Penetrating Trauma.

Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute

Accidental / Intentional Explosions (See Pearls)

- Triage Protocol UP 2 ***as indicated***
- Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***as indicated***
- Multiple Trauma Protocol TB 6 ***if indicated***
- A: IV / IO Procedure ***if indicated***
- P: Cardiac Monitor ***if indicated***
- Thermal Burn Protocol TB 9 / Chemical and Electrical Burn Protocol TB 2 ***if indicated***
- Crush Injury Protocol TB 3 ***if indicated***
- Radiation Incident Protocol TB 7 ***if indicated***

Blast Lung Injury → YES → Age Appropriate Airway Protocol(s) AR 4, 7 ***as indicated***

NO

- Decontamination Procedure ***if indicated***
- Pain Control Protocol UP 11 ***if indicated***
- **Rapid Transport** to appropriate destination using Trauma and Burn: EMS Triage and Destination Plan
- **Notify Destination or Contact Medical Control**

Trauma and Burn Protocol Section

Blast Injury / Incident

Pearls

- **Types of Blast Injury:**
  - Primary Blast Injury: From pressure wave.
  - Secondary Blast Injury: Impaled objects. Debris which becomes missiles / shrapnel.
  - Tertiary Blast Injury: Patient falling or being thrown / pinned by debris.
  - Most Common Cause of Death: Secondary Blast Injuries.
- **Triage of Blast Injury patients:**
  - Blast Injury Patients with Burn Injuries Must be Triaged using the Thermal / Chemical / Electrical Burn Destination Guidelines for Critical / Serious / Minor Trauma and Burns
  - Patients may be hard of hearing due to tympanic membrane rupture.
- **Care of Blast Injury Patients:**
  - Patients may suffer multi-system injuries including blunt and penetrating trauma, shrapnel, barotrauma, burns, and toxic chemical exposure.
  - Consider airway burns which should prompt early and aggressive airway management.
  - Cover open chest wounds with semi-occlusive dressing.
  - Use Lactated Ringers (if available) for all Critical or Serious Burns.
  - Minimize IV fluids resuscitation in patients with no sign of shock or poor perfusion.
- **Blast Lung Injury:**
  - Blast Lung Injury is characterized by respiratory difficulty and hypoxia. Can occur (rarely) in patients without external thoracic trauma. More likely in enclosed space or in close proximity to explosion.
  - Symptoms: Dyspnea, hemoptysis, cough, chest pain, wheezing and hemodynamic instability.
  - Signs: Apnea, tachypnea, hypopnea, hypoxia, cyanosis and diminished breath sounds.
  - Air embolism should be considered and patient transported prone and in slight left-lateral decubitus position.
  - Blast Lung Injury patients may require early intubation but positive pressure ventilation may exacerbate the injury, avoid hyperventilation.
  - Air transport may worsen lung injury as well and close observation is mandated. Tension pneumothorax may occur requiring chest decompression. Be judicious with fluids as volume overload may worsen lung injury.
- **Accidental Explosions or Intentional Explosions:**
  - **All explosions or blasts should be considered intentional until determined otherwise.**
  - Attempt to determine source of the blast to include any potential threat for aerosolization of hazardous materials.
  - Evaluate scene safety to include the source of the blast that may continue to spill explosive liquids or gases.
  - Consider structural collapse / Environmental hazards / Fire.
  - Conditions that led to the initial explosion may be returning and lead to a second explosion.
  - Greatest concern is potential threat for a secondary device.
  - Patients who can, typically will attempt to move as far away from the explosive source as they safely can.
  - Evaluate surroundings for suspicious items; unattended back packs or packages, or unattended vehicles.
  - **If patient is unconscious or there is(are) fatality(fatalities) and you are evaluating patient(s) for signs of life:**
    Before moving note if there are wires coming from the patient(s), or it appears the patient(s) is(are) lying on a package/pack, or bulky item, do not move the patient(s), quickly back away and immediately notify a law enforcement officer.
  - If there are no indications the patient is connected to a triggering mechanism for a secondary device, expeditiously remove the patient(s) from the scene and begin transport to the hospital.
  - Protect the airway and cervical spine, however, beyond the primary survey, care and a more detailed assessment should be deferred until the patient is in the ambulance.
  - If there are signs the patient was carrying the source of the blast, notify law enforcement immediately and most likely, a law enforcement officer will accompany your patient to the hospital.

Chemical and Electrical Burn

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential
- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Assure Chemical Source is NOT Hazardous to Responders.
Assure Electrical Source is NO longer in contact with patient before touching patient.

Assess Burn / Concomitant Injury Severity

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated, Normotensive
GCS 14 or Greater
Minor Burn

5-15% TBSA 2nd/3rd Degree Burn
Suspected inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS 13 or Less
(When reasonably accessible, transport to a Burn Center)
Serious Burn

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definitive airway compromise
(When reasonably accessible, transport to a Burn Center)
Critical Burn

Age Appropriate
Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7
if indicated

Identify Contact Points

Eye Involvement
Irrigate Involved Eye(s) with Normal Saline
for 15 – 30 minutes
May repeat as needed

Chemical Exposure / Burn
Flush Contact Area with Normal Saline for 15 minutes

Decontamination Procedure
if indicated

Age Appropriate Cardiac Protocol(s)
if indicated

Thermal Burn Protocol TB 9

Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

Chemical and Electrical Burn

Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to Triage systems.**
- **Refer to Rule of Nines: Remember the extent of the obvious external burn from an electrical source does not always reflect more extensive internal damage not seen.**
- **Chemical Burns:**
  - Refer to Decontamination Procedure.
  - Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation and use tap water.
  - Other water sources may be used based on availability.
  - Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- **Electrical Burns:**
  - DO NOT contact patient until you are certain the source of the electrical shock is disconnected.
  - Attempt to locate contact points (generally there will be two or more.) A point where the patient contacted the source and a point(s) where the patient is grounded.
  - Sites will generally be full thickness.
  - **Do not refer to as entry and exit sites or wounds.**
  - Cardiac Monitor: Anticipate ventricular or atrial irregularity including VT, VF, atrial fibrillation and / or heart blocks.
  - Attempt to identify the nature of the electrical source (AC / DC), the amount of voltage and the amperage the patient may have been exposed to during the electrical shock.

Crush Syndrome Trauma

History
- Entrapped and crushed under heavy load > 30 minutes
- Extremity / body crushed
- Building collapse, trench collapse, industrial accident, pinned under heavy equipment

Signs and Symptoms
- Hypotension
- Hypothermia
- Abnormal ECG findings
- Pain
- Anxiety

Differential
- Entrapment without crush syndrome
- Vascular injury with perfusion deficit
- Compartment syndrome
- Altered mental status

Age Appropriate Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7 ***as indicated***

B 12 Lead ECG Procedure

A IV / IO Procedure

P Cardiac Monitor

Multiple Trauma Protocol TB 6 ***if indicated***

Thermal Burn Protocol TB 9
Chemical and Electrical Burn Protocol TB 2 ***if indicated***

Pain Control Protocol UP 11 ***as indicated***

P Consider
Midazolam 0.5 – 2 mg IV / IO
Midazolam 1 – 2 mg IN
Maximum 5 mg
Pediatric: 0.1 – 0.2 mg / kg
IV / IO / IN
Pediatric Maximum 2 mg
Over 2 – 3 minutes as needed

Entrapped < 2 hours

A **Normal Saline Infusion**
1 Liter per hour IV / IO
Pediatric:
3 x maintenance fluid rate

Entrapped > 2 hours

A **Decrease Normal Saline Infusion**
500 mL per hour IV / IO
Pediatric:
Maintenance fluid rate

Abnormal ECG
Peaked T Waves
QRS ≥ 0.12 seconds
QT ≥ 0.46 seconds
Loss of P wave
Or
Hemodynamically Unstable
Or
Asystole / PEA / VF / VT

P
Sodium Bicarbonate
50 mEq IV / IO
Pediatric: 1 mEq / kg IV / IO

Calcium Gluconate 2 g IV / IO
Or
(Calcium Chloride 1 g IV / IO)
Pediatric: 20 mg / kg IV / IO
Over 2- 3 minutes

Albuterol Nebulizer
2.5 – 5 mg
May repeat x 3

Exit to Age Appropriate Cardiac Arrest Protocol AC 3 / PC 4 Arrhythmia Protocol(s) ***if indicated***

Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

Crush Syndrome Trauma

Pearls

- **Recommended exam: Mental Status, Musculoskeletal, Neuro**
- **Scene safety is of paramount importance as typical scenes pose hazards to rescuers. Call for appropriate resources.**
- **Lowest blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year: 70 + 2 x age in years.**
- **Pediatric IV Fluid maintenance rate: 4 mL per first 10 kg of weight + 2 mL per second 10 kg of weight + 1 mL for every additional kg in weight.**
- **Crush syndrome typically manifests after 2 – 4 hours of crush injury, but may present in < 1 hour.**
- **Fluid resuscitation:**
  If access to patient and initiation of IV fluids occurs after 2 hours, give 2 liters of IV fluids in adults and 20 mL/kg of IV fluids in pediatrics and then begin > 2 hour dosing regimen.
- **Consider all possible causes of shock and treat per appropriate protocol. Majority of decompensation in pediatrics is airway related.**
- **Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.**
- **Shock may be present with a normal blood pressure initially.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all possible causes of shock and treat per appropriate protocol.**
- **Patients may become hypothermic even in warm environments.**
- Hyperkalemia from crush syndrome can produce ECG changes described in protocol, but may also be a bizarre, wide complex rhythm. Wide complex rhythms should also be treated using the VF/Pulseless VT Protocol.

Extremity Trauma

History
- Type of injury
- Mechanism: crush / penetrating / amputation
- Time of injury
- Open vs. closed wound / fracture
- Wound contamination
- Medical history
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity
- Altered sensation / motor function
- Diminished pulse / capillary refill
- Decreased extremity temperature

Differential
- Abrasion
- Contusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputation

Wound care
Control Hemorrhage with Direct Pressure
Splinting as indicated

Consider
Topical Hemostatic Agent / Dressing
if available

Wound Care - Tourniquet Procedure
if indicated

A IV / IO Procedure
if indicated

Age Appropriate
Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7
if indicated

Multiple Trauma Protocol TB 6
if indicated

Age Appropriate Hypotension / Shock
Protocol AM 5 / PM 3
if indicated

Pain Protocol UP 11
if indicated

Crush Syndrome Protocol TB 3
as indicated

Amputation and / or
Open Fracture

YES → Clean amputated part, Wrap part in sterile dressing soaked in normal saline and place in air tight container.

Place container on ice if available.

NO

P **ANCEF 1 gm IV**
or
Kefzol 1 gm IV
or
Cefazolin 1 gm IV

Monitor and Reassess

Notify Destination or
Contact Medical Control

Trauma and Burn Protocol Section

Pearls
- **Recommended Exam: Mental Status, Extremity, Neuro**
- Peripheral neurovascular status is important
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.
- Multiple casualty incident: Tourniquet Procedure may be considered first instead of direct pressure.

Head Trauma

History
- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma

Signs and Symptoms
- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Major traumatic mechanism of injury
- Seizure

Differential
- Skull fracture
- Brain injury (Concussion, Contusion, Hemorrhage or Laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

Age Appropriate
Airway Protocol(s) AR 1, 2, 3, 5, 6
if indicated

Obtain and Record GCS

Supplemental oxygen
Maintain SpO2 ≥ 90%
Preferably ≥ 94%

Prevent Oxygen desaturation events < 90%

Maintain EtCO2
35 – 45 mmHg

Blood Glucose Analysis Procedure

A IV / IO Procedure
if indicated

P Cardiac Monitor

Altered Mental Status
Protocol UP 4
if indicated

Multiple Trauma Protocol TB 6
if indicated

Age Appropriate
Hypotension / Shock
Protocol AM 5 / PM 3
if indicated

Seizure Protocol UP 13
if indicated

Spinal Motion Restriction
Procedure / Protocol TB 8
if indicated

Pain Control Protocol UP 11
if indicated

Monitor and Reassess

DO NOT ROUTINELY HYPERVENTILATE

Evidence of Brain Herniation:
Unilateral or Bilateral Dilation of Pupils / Posturing

Hyperventilate to maintain
EtCO2 30 – 35 mmHg
See Pearls

Rapid Transport to appropriate destination using
Trauma and Burn: EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

Head Trauma

Eye Opening Response	Verbal Response	Motor Response
4 = Spontaneous	5 = Oriented	6 = Obeys commands
3 = To verbal stimuli	4 = Confused	5 = Localizes pain
2 = To pain	3 = Inappropriate words	4 = Withdraws from pain
1 = None	2 = Incoherent	3 = Flexion to pain or decorticate
	1 = None	2 = Extension to pain or decerebrate
		1 = None

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- **GCS is a key performance measure used in the EMS Acute Trauma Care Toolkit.**
- **A single episode of hypoxia and / or hypotension can significantly increase morbidity and mortality with head injury.**
- **Hyperventilation in head injury:**
  - **Hyperventilation lowers CO_2 and causes vasoconstriction leading to increased intracranial pressure (ICP) and should not be done routinely.**
  - **Use in patient with evidence of herniation (blown pupil, decorticate / decerebrate posturing, bradycardia, decreasing GCS).**
  - **If hyperventilation is needed, ventilate at 14 – 18 / minute to maintain $EtCO_2$ between 30 - 35 mmHg.**
  - **Short term option only used for severe head injury typically GCS ≤ 8 or unresponsive.**
- **Do not place in Trendelenburg position as this may increase ICP and worsen blood pressure.**
- **Poorly fitted cervical collars may also increase ICP when applied too tightly.**
- **In areas with short transport times, Drug Assisted Airway protocol is not recommended for patients who are spontaneously breathing and who have oxygen saturations of ≥ 90% with supplemental oxygen including BIAD / BVM.**
- **Hypotension:**
  - Limit IV fluids unless patient is hypotensive.
  - Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
  - Usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
  - Fluid resuscitation should be titrated to maintain at least a systolic BP of > 70 + 2 x the age in years.
  - **Lowest blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year: 70 + 2 x age in years.**
- An important item to monitor and document is a change in the level of consciousness by serial examination.
- Consider Restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- **Concussions:**
  - Traumatic brain injuries involving any of a number of symptoms including confusion, LOC, vomiting, or headache.
  - Any prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.
  - **EMS Providers should not make return-to-play decisions when evaluating an athlete with suspected concussion. This is outside the scope of practice.**

Multiple Trauma

History
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / protective equipment
- Past medical history
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

Differential (Life threatening)
- Chest: Tension pneumothorax
  Flail chest
  Pericardial tamponade
  Open chest wound
  Hemothorax
- Intra-abdominal bleeding
- Pelvis / Femur fracture
- Spine fracture / Cord injury
- Head injury (see Head Trauma)
- Extremity fracture / Dislocation
- HEENT (Airway obstruction)
- Hypothermia

Age Appropriate
Airway Protocol(s) AR 1, 2, 3, 5, 6
if indicated

Control External Hemorrhage
Consider Pelvic Binding
Splint Suspected Fractures

P — Chest Decompression-Needle Procedure
if indicated

Obtain and Record GCS

A — IV / IO Procedure

P — Cardiac Monitor

Head Injury Protocol TB 5
if indicated

Altered Mental Status
Protocol UP 4
if indicated

Spinal Motion Restriction
Procedure / Protocol TB 8
if indicated

Pain Control Protocol UP 11
if indicated

VS / Perfusion / GCS

Normal

Repeat Assessment Adult Procedure

Monitor and Reassess

Abnormal

Age Appropriate Hypotension / Shock
Protocol AM 5 / PM 3
if indicated

P — **TXA 1 gm over 10 minutes IV / IO**
if indicated

Monitor and Reassess

Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan
Limit Scene Time ≤ 10 minutes
Provide Early Notification

Notify Destination or Contact Medical Control

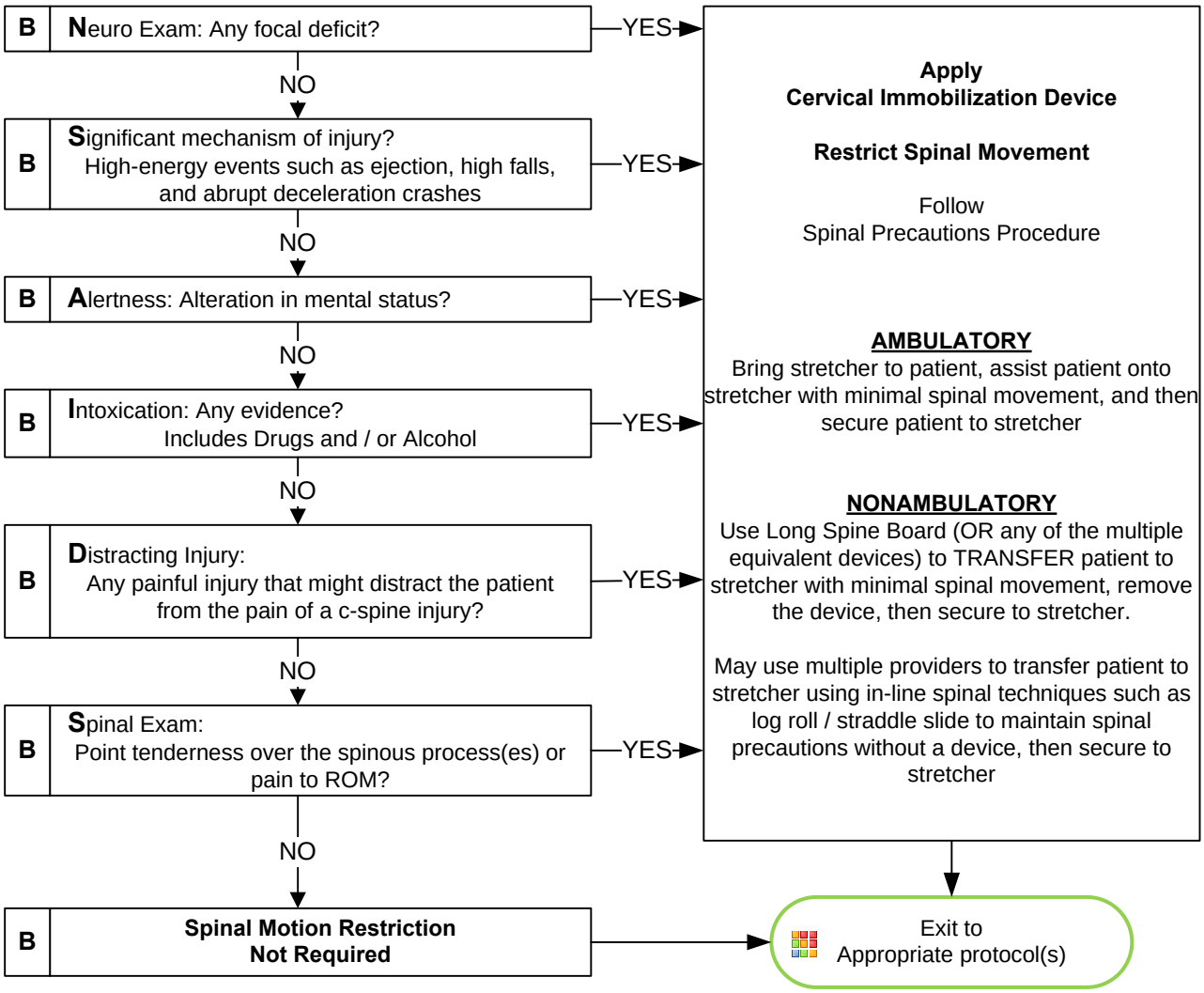
Trauma and Burn Protocol Section

Multiple Trauma

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- **Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient to the appropriate facility is the goal.**
- **Control external hemorrhage and prevent hypothermia by keeping patient warm.**
- **Consider Chest Decompression with signs of shock and injury to torso and evidence of tension pneumothorax.**
- **Trauma Triad of Death:**
  Metabolic acidosis / Coagulopathy / Hypothermia
  Appropriate resuscitation measures and keeping patient warm regardless of ambient temperature helps to mitigate metabolic acidosis, coagulopathy, and hypothermia.
- **Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained ≥ 90%**
- **Tranexamic Acid (TXA):**
  Agencies utilizing TXA must have approval from your T-RAC.
- **Trauma in Pregnancy:**
  Providing optimal care for the mother = optimal care for the fetus. After 20 weeks gestation (fundus at or above umbilicus) transport patient on left side with 10 – 20° of elevation.
- **Pediatric Trauma:**
  Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 11 years and older > 90 mmHg.
- **Geriatric Trauma:**
  Evaluate with a high index of suspicion.
  Often occult injuries are more difficult to recognize and patients can decompensate unexpectedly with little warning.
  Risk of death with trauma increases after age 55.
  SBP < 110 may represent shock / poor perfusion in patients over age 65.
  Low impact mechanisms, such as ground level falls might result in severe injury especially in age over 65.
- See Regional Trauma Guidelines when declaring Trauma Activation.
- Severe bleeding from an extremity not rapidly controlled with direct pressure may necessitate the application of a tourniquet.
- Maintain high-index of suspicion for domestic violence or abuse, pediatric non-accidental trauma, or geriatric abuse.

Selective Spinal Motion Restriction



Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Patients meeting all the above criteria do not require spinal motion restriction. However, patients who fail one or more criteria above require spinal motion restriction, but does NOT require use of the long spine board for immobilization.**
- **Long spine boards are NOT considered standard of care in most cases of potential spinal injury. Spinal motion restriction with cervical collar and securing patient to cot, while padding all void areas is appropriate.**
- **True spinal immobilization is not possible. Spine protection and spinal motion restriction do not equal long spine board.**
- **Spinal motion restriction is always utilized in at-risk patients. These include cervical collar, securing to stretcher, minimizing movement / transfers and maintenance of in-line spine stabilization during any necessary movement / transfers. This includes the elderly or others with body or spine habitus preventing them from lying flat.**
- **Consider spinal motion restriction in patients with arthritis, cancer, dialysis, underlying spine or bone disease.**
- Range of motion (ROM) is tested by touching chin to chest (look down), extending neck (look up), and turning head from side to side (shoulder to shoulder) without posterior cervical mid-line pain. ROM should NOT be assessed if patient has midline spinal tenderness. Patient's range of motion should not be assisted.
- **Immobilization on a long spine board is not necessary where:**
  - **Penetrating trauma to the head, neck or torso with no signs / symptoms of spinal injury.**
- **Concerning mechanisms that may result in spinal column injury:**
  - **Fall from ≥ 3 feet and/or ≥ 5 stairs or steps**
  - **MVC ≥ 30 mph, rollover, and/or ejection**
  - **Motorcycle, bicycle, other mobile device, or pedestrian-vehicle crash**
  - **Diving or axial load to spine**
  - **Electric shock**

Thermal Burn

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/ distress could be indicated by hoarseness/wheezing

Differential
- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Assess Burn / Concomitant Injury Severity

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated, Normotensive
GCS 14 or Greater
Minor Burn

5-15% TBSA 2nd/3rd Degree Burn
Suspected inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS 13 or Less
(When reasonably accessible, transport to a Burn Center)
Serious Burn

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definitive airway compromise
(When reasonably accessible, transport to a Burn Center)
Critical Burn

Airway Protocol(s) AR 1, 2, 3, 5, 6 ***as indicated***

Multiple Trauma Protocol TB 6 ***if indicated***

Remove Rings, Bracelets / Constricting Items

Dry Clean Sheet or Dressings

A

IV / IO Procedure
Consider 2 IV sites if greater than 15 % TBSA

Normal Saline
0.25 mL / kg (x % TBSA) / hr
for up to the first 8 hours.
(More info below)
Lactated Ringers if available

Pain Control Protocol UP 11 ***if indicated***

Carbon Monoxide / Cyanide Protocol TE 2 ***if indicated***

Monitor and Reassess

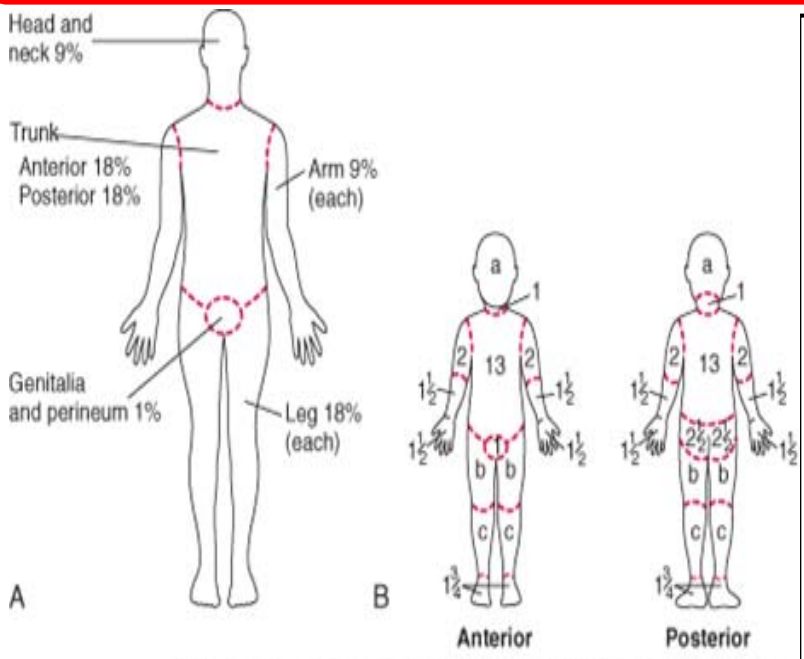
Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

1. Lactated Ringers preferred over Normal Saline. Use if available, if not change over once available.
2. Formula example; an 80 kg (196 lbs.) patient with 50% TBSA will need 1000 cc of fluid per hour.

Trauma and Burn Protocol Section

Thermal Burn



Relative percentage of body surface area (% BSA) affected by growth

	Age				
Body Part	0 yr	1 yr	5 yr	10 yr	15 yr
a = 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2
b = 1/2 of 1 thigh	2 3/4	3 1/4	4	4 1/4	4 1/2
c = 1/2 of 1 lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4

Rule of Nines

- Seldom do you find a complete isolated body part that is injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1st degree burn from those of partial (2nd) or full (3rd) thickness burns.
- For the purpose of determining Total Body Surface Area (TBSA) of burn, include only Partial and Full Thickness burns. Report the observation of other superficial (1st degree) burns but do not include those burns in your TBSA estimate.
- Some texts will refer to 4th 5th and 6th degree burns. There is significant debate regarding the actual value of identifying a burn injury beyond that of the superficial, partial and full thickness burn at least at the level of emergent and primary care. For our work, all are included in Full Thickness burns.
- Other burn classifications in general include:
  - 4th referring to a burn that destroys the dermis and involves muscle tissue.
  - 5th referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
  - 6th referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

Estimate spotty areas of burn by using the size of the patient's palm as 1 %

Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to the Start / JumpStart Triage System.**
- **Critical or Serious Burns:**
  - ***> 5-15% total body surface area (TBSA) 2nd or 3rd degree burns, or***
  - ***3rd degree burns > 5% TBSA for any age group, or***
  - ***circumferential burns of extremities, or***
  - ***electrical or lightning injuries, or***
  - ***suspicion of abuse or neglect, or***
  - ***inhalation injury, or***
  - ***chemical burns, or***
  - ***burns of face, hands, perineum, or feet***
- Require direct transport to a Burn Center. Local facility should be utilized only if distance to Burn Center is excessive or critical interventions such as airway management are not available in the field.
- Burn patients are trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Early intubation is required when the patient experiences significant inhalation injuries.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn, must maintain normal body temperature.
- Evaluate the possibility of geriatric abuse with burn injuries in the elderly.
- Never administer IM pain injections to a burn patient.

Traumatic Arrest

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES →
- Decomposition
- Rigor mortis
- Dependent lividity
- Blunt force trauma
- Injury incompatible with life
- Downtime ≥ 15 minutes with asystole

DNR / MOST Form

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

Blunt Arrest

YES
- Apnea — NO
- YES
- Pulseless — NO
- YES
- Asystole or PEA < 40 — NO
- YES

Do not begin resuscitation
Follow Deceased Subjects Policy

Penetrating Arrest

YES
- Apnea — NO
- YES
- Pulseless — NO
- YES
- Asystole or PEA < 40 — NO
- YES
- Pupil Reflexes — YES
- NO
- Spontaneoius Body Movement — YES
- NO

Do not begin resuscitation
Follow Deceased Subjects Policy

Cardiopulmonary Resuscitation Procedure

- Airway Protocol(s) AR 1, 2, 3, 5, 6 ***if indicated***
- Control External Hemorrhage
  Splint Suspected Fractures
  Consider Pelvic Binding
- **P** Chest Decompression-Needle Procedure ***if indicated***
- **Spinal Motion Restriction Procedure Protocol TB 8** ***If indicated***
- **A** IV / IO Procedure

Rapid Transport to **Nearest ER** or appropriate destination using **Trauma and Burn: EMS Triage and Destination Plan**
Limit Scene Time ≤ 10 minutes
Provide Early Notification

Trauma and Burn Protocol Section

Traumatic Arrest

Pearls.

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Withholding resuscitative efforts with blunt and penetrating trauma victims who meet criteria is appropriate.**
- **If transport time to Trauma Center is < 15 minutes use of ECG monitor may delay resuscitation.**
- **Rhythm determination is more helpful in rural settings or where transport to nearest facility is > 15 minutes. Omit from algorithm where appropriate.**
- **Organized rhythms for the purposes of this protocol include Ventricular Tachycardia, Ventricular Fibrillation and PEA.**
- **Wide, bizarre rhythms such as Idioventricular and severely brachycardic rhythms < 40 BPM are not organized rhythms.**
- **First arriving EMS personnel should make the assessment concerning agonal respirations, pulselessness, asystole or PEA < 40, pupillary reflexes and spontaneous body movements.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and difficult IV anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute.**
- **ALS procedures should optimally be performed during rapid transport.**
- **<u>Time considerations:</u>**

  From the time cardiac arrest is identified, if CPR is performed ≥ 15 minutes with no ROSC consider termination of resuscitation.

  From the time cardiac arrest is identified, if transport time to closest Trauma Center is > 15 minutes consider termination of resuscitation.
- Lightning strike, drowning or in situations causing hypothermia resuscitation should be initiated.
- Where multiple lightning strike victims are found used Reverse Triage: Begin CPR where apneic / pulseless
- Agencies utilizing Targeted Temperature Management Protocol should not cool the trauma patient, but rather make every effort to maintain warmth.

Bites and Envenomations

History
- Type of bite / sting
- Description / photo for identification
- Time, location, size of bite / sting
- Previous reaction to bite / sting
- Domestic vs. Wild
- Tetanus and Rabies risk
- Immunocompromised patient

Signs and Symptoms
- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

Differential
- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting / bite (bee, wasp, ant, tick)
- Infection risk
- Rabies risk
- Tetanus risk

Call for help / additional resources
Stage until scene safe

If Needed
Carolinas Poison Control
1-800-222-1222

General Wound Care Procedure

Immobilize Injury

Remove any constricting clothing / bands / jewelry

A IV / IO Procedure ***if indicated***

Age Appropriate Trauma Protocol(s) TB 4, 5, 6 ***if indicated***

Age Appropriate Allergic Reaction/ Anaphylaxis Protocol AM 1 / PM 1 ***if indicated***

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***if indicated***

Pain Control Protocol UP 11 ***if indicated***

Extremity Trauma Protocol TB 4 ***if indicated***

Identification of Animal

Spider Bite / Bee or Wasp Sting
- Keep bite at level of heart ***if able***
- Apply Ice Packs

P

<u>Muscle Spasm</u>
Midazolam 2 – 2.5 mg IV / IO
Over 2 to 3 minutes
Midazolam IN See Page 2
Maximum 10 mg
Pediatrics:
Midazolam 0.1 – 0.2 mg / kg
IV / IO / IM / IN
Over 2 to 3 minutes
Maximum 5 mg IM

Snake Bite
- Keep bite at level of heart ***if able***
- Remove any constricting clothing / bands
- **DO NOT apply ICE**
- Mark Margin of Swelling / Redness and Time

Mammal Bite
Transport
- NO → Contact and Document contact with Animal Control Officer
- YES

Monitor and Reassess

Notify Destination or Contact Medical Control

Toxin-Environmental Protocol Section

Bites and Envenomations

Pearls

- **Recommended Exam: Mental Status, Skin, Extremities (Location of injury), and a complete Neck, Lung, Heart, Abdomen, Back, and Neuro exam if systemic effects are noted**
- **Immunocompromised patients are at an increased risk for infection: diabetes, chemotherapy, transplant patients.**
- **Consider contacting the North Carolina Poison Control Center for guidance (1-800-222-1222).**
- **Do not put responders in danger attempting to capture and animal or insect for identification purposes.**
- **Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.**
- **Human bites:**
  Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- **Dog / Cat / Carnivore bites:**
  Carnivore bites are much more likely to become infected and all have risk of Rabies exposure.
  Cat bites may progress to infection rapidly due to a specific bacteria (Pasteurella multicoda).
- **Snake bites:**
  Poisonous snakes in this area are generally of the pit viper family: rattlesnake and copperhead.
  Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
  Amount of envenomation is variable, generally worse with larger snakes and early in spring.
  If no pain or swelling, envenomation is unlikely. About 25 % of snake bites are “dry” bites.
- **Spider bites:**
  Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hourglass on belly).
  Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).

Carbon Monoxide / Cyanide

History
- Smoke inhalation
- Ingestion of cyanide
- Eating large quantity of fruit pits
- Industrial exposure
- Trauma
- Reason: Suicide, criminal, accidental
- Past Medical History
- Time / Duration of exposure

Signs and Symptoms
- AMS
- Malaise, weakness, flu like illness
- Dyspnea
- GI Symptoms; N/V; cramping
- Dizziness
- Seizures
- Syncope
- Reddened skin
- Chest pain

Differential
- Diabetic related
- Infection
- MI
- Anaphylaxis
- Renal failure / dialysis problem
- Head injury / trauma
- Co-ingestant or exposures

Immediately Remove from Exposure

Appropriate Airway Protocol(s) 1 - 7 ***as indicated***

High Flow Oxygen

Blood Glucose Analysis Procedure

B 12 Lead ECG Procedure

A IV/ IO Procedure

P Cardiac Monitor / CO Monitor

Altered Mental Status Protocol UP 4 ***if indicated***

Age Appropriate Diabetic Protocol AM 2 / PM 2 ***if indicated***

Age Appropriate Multiple Trauma Protocol TB 6 Head Injury TB 5 ***if indicated***

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***if indicated***

High Suspicion of Cyanide

YES → P **Hydroxocobalamin 70 mg / kg IV / IO Maximum 5 g** ***If available***

NO

Continue Care
Continue High Flow Oxygen
Monitor and Reasses

Notify Destination or Contact Medical Control

Pearls
- **Recommended exam: Neuro, Skin, Heart, Lungs, Abdomen, Extremities**
- **Scene safety is priority.**
- Consider CO and Cyanide with any product of combustion
- Normal environmental CO level does not exclude CO poisoning.
- Symptoms present with lower CO levels in pregnancy, children and the elderly.
- Continue high flow oxygen regardless of pulse ox readings.

Drowning

History
- Submersion in water regardless of depth
- Possible history of trauma
  Slammed into shore wave break
- Duration of submersion / immersion
- Temperature of water or possibility of hypothermia

Signs and Symptoms
- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Foaming / Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor
- Apnea

Differential
- Trauma
- Pre-existing medical problem
  - Hypoglycemia
  - Cardiac Dysrhythmia
- Pressure injury (SCUBA diving)
  - Barotrauma
  - Decompression sickness
- Post-immersion syndrome

Awake and Alert

- Supplemental Oxygen ***as tolerated***
- Spinal Motions Restriction Procedure / Protocol TB 8 ***if indicated***
- Remove wet clothing
  Dry / Warm Patient
- Monitor and Reassess
- **Encourage transport and evaluation even if asymptomatic or with minimal symptoms**
  Asymptomatic drowning patients (refusing transport) should be instructed to seek medical care/call 911 if they develop any symptoms within 6 hours
- A: IV / IO Procedure ***if indicated***
- P: Cardiac Monitor ***as indicated***

Awake but with AMS

- 5 Breaths via BVM / mouth-to-mouth ***as tolerated***
- Supplemental Oxygen ***as tolerated***
- Age Appropriate Airway Protocol(s) 1-7 ***as indicated***
- Spinal Motion Restriction Procedure / Protocol TB 8 ***if indicated***
- Altered Mental Status Protocol UP 4 ***as indicated***
- Remove wet clothing
  Dry / Warm Patient
- A: IV / IO Procedure
- P: Cardiac Monitor

Age Appropriate Airway Protocol(s) AR 1 - 7 ***as indicated***

Notify Destination or Contact Medical Control

Unresponsive

- 5 Breaths via BVM / mouth-to-mouth ***as tolerated***

Pulse
- YES → Age Appropriate Airway Protocol(s) 1-7 ***as indicated***
- NO → Exit to Age Appropriate Cardiac Arrest Protocol(s) AC 3 / PC 4
  Airway Protocol(s) AR 1 - 7
  Spinal Motion Restriction Protocol TB 8 ***as indicated***

Dive Accident / Barotrauma
Divers Alert Network
1-919-684-9111

Agency specific hyperbaric information

Toxic-Environmental Protocol Section

Pearls
- **Recommended Exam: Respiratory, Mental status, Trauma Survey, Skin, Neuro**
- **Drowning is the process of experiencing respiratory impairment (any respiratory symptom) from submersion / immersion in a liquid.**
- **Begin with BVM ventilations, if patient does not tolerate then apply appropriate mode of supplemental oxygen.**
- **Ensure scene safety. Drowning is a leading cause of death among would-be rescuers.**
- **When feasible, only appropriately trained and certified rescuers should remove patients from areas of danger.**
- **Regardless of water temperature – resuscitate all patients with known submersion time of ≤ 25 minutes.**
- **Regardless of water temperature – If submersion time ≥ 1 hour consider moving to recovery phase instead of rescue.**
- **Foam is usually present in airway and may be copious, DO NOT waste time attempting to suction. Ventilate with BVM through foam (suction water and vomit only when present.)**
- **Cardiac arrest in drowning is caused by hypoxia, airway and ventilation are equally important to high-quality CPR.**
- **Encourage transport of all symptomatic patients (cough, foam, dyspnea, abnormal lung sounds, hypoxia) due to potential worsening over the next 6 hours.**
- Predicting prognosis in prehospital setting is difficult and does not correlate with mental status. Unless obvious death, transport.
- Hypothermia is often associated with drowning and submersion injuries even with warm ambient conditions.
- Drowning patient typically has <1 – 3 mL/kg of water in lungs (does not require suction) Primary treatment is reversal of hypoxia.
- Spinal motion restriction is usually unnecessary. When indicated it should not interrupt ventilation, oxygenation and / or CPR.

Hyperthermia

History
- Age, very young and old
- Exposure to increased temperatures and / or humidity
- Past medical history / Medications
- Time and duration of exposure
- Poor PO intake, extreme exertion
- Fatigue and / or muscle cramping

Signs and Symptoms
- Altered mental status / coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

Differential
- Fever (Infection)
- Dehydration
- Medications
- Hyperthyroidism (Thyroid Storm)
- Delirium tremens (DT's)
- Heat cramps, exhaustion, stroke
- CNS lesions or tumors

B Temperature Measurement Procedure ***if available***

Temperature Measurement should NOT delay treatment of hyperthermia

Remove from heat source to cool environment

Cooling measures

Remove tight clothing

Blood Glucose Analysis Procedure

Age Appropriate Diabetic Protocol AM 2 / PM 2 ***as indicated***

Assess Symptom Severity

HEAT CRAMPS
Normal to elevated body temperature
Warm, moist skin
Weakness, Muscle cramping

PO Fluids as tolerated

Monitor and Reassess

HEAT EXHAUSTION
Elevated body temperature
Cool, moist skin
Weakness, Anxious, Tachypnea

HEAT STROKE
Fever, usually > 104°F (40°C)
Hot, dry skin
Hypotension, AMS / Coma

Age Appropriate Airway Protocol(s) AR 1 - 7 ***as indicated***

Altered Mental Status Protocol UP 4 ***as indicated***

Active cooling measures
Target Temp < 102.5° F (39°C)

B 12 Lead ECG Procedure

A IV / IO Procedure

P Cardiac Monitor

A **Normal Saline Bolus**
500 mL IV / IO
Repeat to effect SBP > 90
Maximum 2 L
PED: Bolus 20 mL/kg IV / IO
Repeat to effect Age appropriate
SBP ≥ 70 + 2 *x* Age
Maximum 60 mL/kg

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***as indicated***

Monitor and Reassess

Notify Destination or Contact Medical Control

Toxic-Environmental Protocol Section

Hyperthermia

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro**
- **Extremes of age are more prone to heat emergencies (i.e. young and old). Obtain and document patient temperature if able.**
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, Amphetamines, and Salicylates may elevate body temperatures.
- Intense shivering may occur as patient is cooled.
- **Heat Cramps:**
  Consists of benign muscle cramping secondary to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion:**
  Consists of dehydration, salt depletion, dizziness, fever, mental status changes, headache, cramping, nausea and vomiting.
  Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke:**
  Consists of dehydration, tachycardia, hypotension, temperature ≥ 104°F (40°C), and an altered mental status.
  Sweating generally disappears as body temperature rises above 104°F (40°C).
  The young and elderly are more prone to be dry with no sweating.
  Exertional Heat Stroke:
  In exertional heat stroke (athletes, hard labor), the patient may have sweated profusely and be wet on exam.
  Rapid cooling takes precedence over transport as early cooling decreases morbidity and mortality.
  If available, immerse in an ice water bath for 5 – 10 minutes. Monitor rectal temperature and remove patient when temperature reaches 102.5°F (39°C). Your goal is to decrease rectal temperature below 104°F (40°C) with target of 102.5°F (39°C) within 30 minutes. Stirring the water aids in cooling.
  Other methods include cold wet towels below and above the body or spraying cold water over body continuously.
- **Neuroleptic Malignant Syndrome (NMS):**
  Neuroleptic Malignant Syndrome is a hyperthermic emergency which is not related to heat exposure.
  It occurs after taking neuroleptic antipsychotic medications.
  This is a rare but often lethal syndrome characterized by muscular rigidity, AMS, tachycardia and hyperthermia.
  Drugs Associated with Neuroleptic Malignant Syndrome:
  Prochlorperazine (Compazine), promethazine (Phenergan), clozapine (Clozaril), and risperidone (Risperdal) metoclopramide (Reglan), amoxapine (Ascendin), and lithium.
  Management of NMS:
  Supportive care with attention to hypotension and volume depletion.
  Use benzodiazepines such as diazepam or midazolam for seizures and / or muscular rigidity.

Hypothermia / Frostbite

History
- Age, very young and old
- Exposure to decreased temperatures but may occur in normal temperatures
- Past medical history / Medications
- Drug use: Alcohol, barbituates
- Infections / Sepsis
- Length of exposure / Wetness / Wind chill

Signs and Symptoms
- Altered mental status / coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

Differential
- Sepsis
- Environmental exposure
- Hypothyroidism
- Hypoglycemia
- CNS dysfunction
  - Stroke
  - Head injury
  - Spinal cord injury

B Temperature Measurement Procedure ***if available***

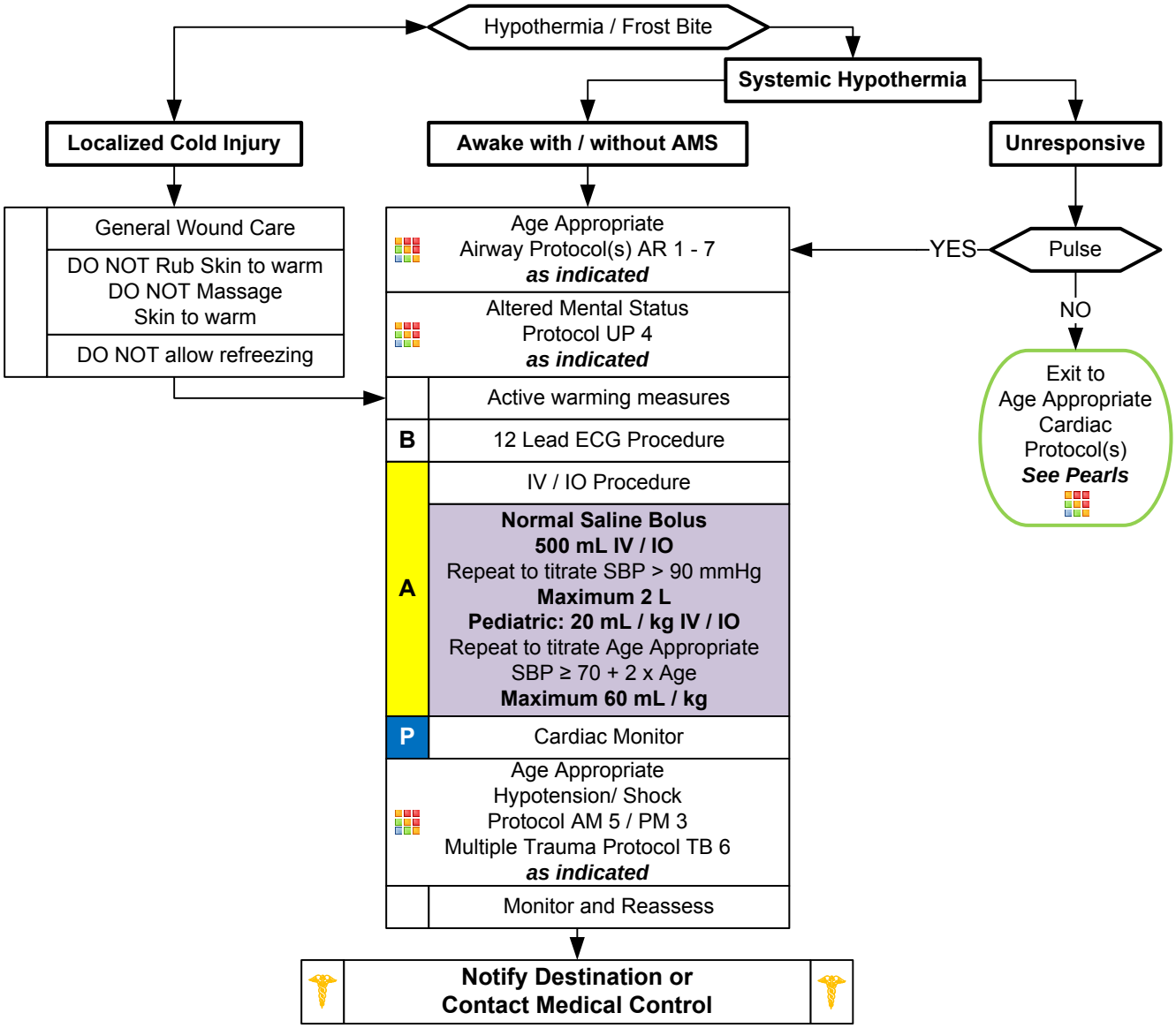
Temperature Measurement should NOT delay treatment of hypothermia

Remove wet clothing
Dry / Warm Patient

Passive warming measures

Blood Glucose Analysis Procedure

Age Appropriate
Diabetic Protocol AM 2 / PM 2
as indicated



Toxic-Environmental Protocol Section

Hypothermia / Frostbite

Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro**
- **NO PATIENT IS DEAD UNTIL WARM AND DEAD (Body temperature ≥ 93.2° F, 32° C.)**
- **Many thermometers do not register temperature below 93.2° F.**
- **Hypothermia categories:**
  Mild 90 – 95° F (32 – 35° C)
  Moderate 82 – 90° F (28 – 32° C)
  Severe < 82° F (< 28° C)
- **Mechanisms of hypothermia:**
  Radiation: Heat loss to surrounding objects via infrared energy (60% of most heat loss.)
  Convection: Direct transfer of heat to the surrounding air.
  Conduction: Direct transfer of heat to direct contact with cooler objects (important in submersion.)
  Evaporation: Vaporization of water from sweat or other body water losses.
- Contributing factors of hypothermia: Extremes of age, malnutrition, alcohol or other drug use.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- **CPR:**
  Severe hypothermia may cause cardiac instability and rough handling of the patient theoretically can cause ventricular fibrillation. This has not been demonstrated or confirmed by current evidence. Intubation and CPR techniques should not be with-held due to this concern.
  Intubation can cause ventricular fibrillation so it should be done gently by most experienced person.
  Below 86°F (30° C) antiarrhythmics may not work and if given should be given at increased intervals. Contact medical control for direction. Epinephrine / Vasopressin can be administered. Below 86° F (30°C) pacing should not utilized.
  Consider withholding CPR if patient has organized rhythm or has other signs of life. Contact Medical Control.
  If the patient is below 86° F (30° C) then defibrillate 1 time if defibrillation is required. Deferring further attempts until more warming occurs is controversial. Contact medical control for direction.
  Hypothermia may produce severe bradycardia so take at least 60 seconds to palpate a pulse.
- **Active Warming:**
  Remove from cold environment and to warm environment protected from wind and wet conditions.
  Remove wet clothing and provide warm blankets / warming blankets.
  Hot packs can be activated and placed in the armpit and groin area if available. Care should be taken not to place the packs directly against the patient's skin.

Marine Envenomations / Injury

History
- Type of bite / sting
- Identification of organism
- Previous reaction to marine organism
- Immunocompromised
- Household pet

Signs and Symptoms
- Intense localized pain
- Increased oral secretions
- Nausea / vomiting
- Abdominal cramping
- Allergic reaction / anaphylaxis

Differential
- Jellyfish sting
- Sea Urchin sting
- Sting ray barb
- Coral sting
- Swimmers itch
- Cone Shell sting
- Fish bite
- Lion Fish sting

General Wound Care Procedure

A: IV / IO Procedure ***if indicated***

P: Cardiac Monitor ***if indicated***

Drowning Protocol TE 3 ***if indicated***

Age Appropriate Allergy / Anaphylaxis Protocol AM 1 / PM 1 ***if indicated***

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***if indicated***

Pain Control Protocol UP 11 ***if indicated***

If Needed
Carolinas Poison Control
1-800-222-1222

Identification of Sea Creature

Jelly Fish / Anemone / Man-O-War
- Immobilize injury
- Lift away tentacles Do Not brush or rub
- Apply Vinegar Rinse ***If available*** Otherwise wash with clean seawater DO NOT use fresh water or ice

Sting Ray / Lion Fish / Urchin / Starfish
- Immobilize injury
- Remove Barb or Spine If large Barb in thorax or abdomen stabilize object
- Immerse in Hot Water 110 – 114°F (43 - 46°C) ***if available***

Large Organism
- Immobilize injury
- Multiple Trauma Protocol TB 6 ***if indicated***
- Extremity Trauma Protocol TB 4 ***if indicated***

Monitor and Reassess

Notify Destination or Contact Medical Control

Toxic-Environmental Protocol Section

Marine Envenomations / Injury

Pearls

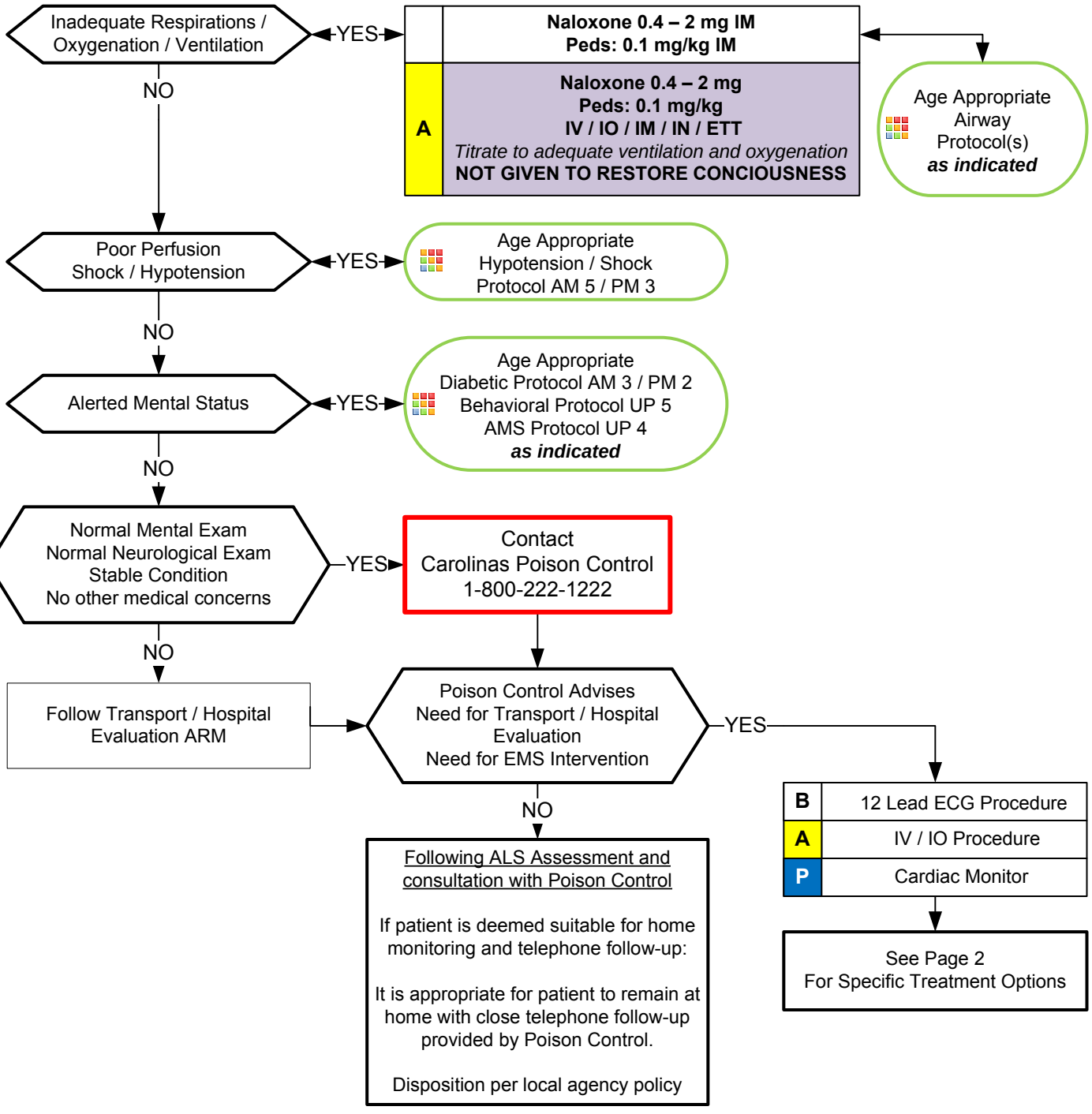
- **Ensure your safety: Avoid the organism or fragments of the organism as they may impart further sting / injury.**
- **Priority is removal of the patient from the water to prevent drowning.**
- **Coral:**
  - Coral is covered by various living organisms which are easily dislodged from the structure.
  - Victim may swim into coral causing small cuts and abrasions and the coral may enter to cuts causing little if any symptoms initially.
  - The next 24 – 48 hours may reveal an inflammatory reaction with swelling, redness, itching, tenderness and ulceration.
  - Treatment is flushing with large amounts of fresh water or soapy water then repeating
- **Jelly Fish / Anemone / Man-O-War:**
  - Wash the area with fresh seawater to remove tentacles and nematocysts.
  - Do not apply fresh water or ice as this will cause nematocysts firing as well.
  - Recent evidence does not demonstrate a clear choice of any solution that neutralizes nematocysts.
  - Vinegar (immersion for 30 seconds), 50:50 mixture of Baking Soda and Seawater, and even meat tenderizer may have similar effects.
  - Immersion in warm water for 20 minutes, 110 – 114°F (43 - 46°C), has recently been shown to be effective in pain control.
  - Shaving cream may be useful in removing the tentacles and nematocysts with a sharp edge (card).
  - Stimulation of the nematocysts by pressure or rubbing cause the nematocyst to fire even if detached from the jellyfish.
  - Lift away tentacles as scrapping or rubbing will cause nematocysts firing.
  - Typically symptoms are immediate stinging sensation on contact, intensity increases over 10 minutes.
  - Redness and itching usually occur.
  - Papules, vesicles and pustules may be noted and ulcers may form on the skin.
  - Increased oral secretions and gastrointestinal cramping, nausea, pain or vomiting may occur.
  - Muscle spasm, respiratory and cardiovascular collapse may follow.
- **Lionfish:**
  - In North Carolina this would typically occur in the home as they are often kept as pets in saltwater aquariums.
  - Remove any obvious protruding spines and irrigate area with copious amounts of saline.
  - The venom is heat labile so immersion in hot water, 110 – 114 degrees for 30 to 90 minutes is the treatment of choice but do not delay transport if indicated.
- **Stingrays:**
  - Typical injury is swimmer stepping on ray and muscular tail drives 1 – 4 barbs into victim.
  - Venom released when barb is broken.
  - Typical symptoms are immediate pain which increases over 1 – 2 hours. Bleeding may be profuse due to deep puncture wound.
  - Nausea, vomiting, diarrhea, muscle cramping and increased urination and salivation may occur.
  - Seizures, hypotension and respiratory or cardiovascular collapse may occur.
  - Irrigate wound with saline. Extract the spine or barb unless in the abdomen or thorax, contact medical control for advise.
  - Immersion in hot water if available for 30 to 90 minutes but do not delay transport.
- Patients can suffer cardiovascular collapse from both the venom and / or anaphylaxis even in seemingly minor envenomations.
- Sea creature stings and bites impart moderate to severe pain.
- Arrest the envenomation by inactivation of the venom as appropriate.
- Ensure good wound care, immobilization and pain control.

Overdose / Toxic Ingestion

History
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

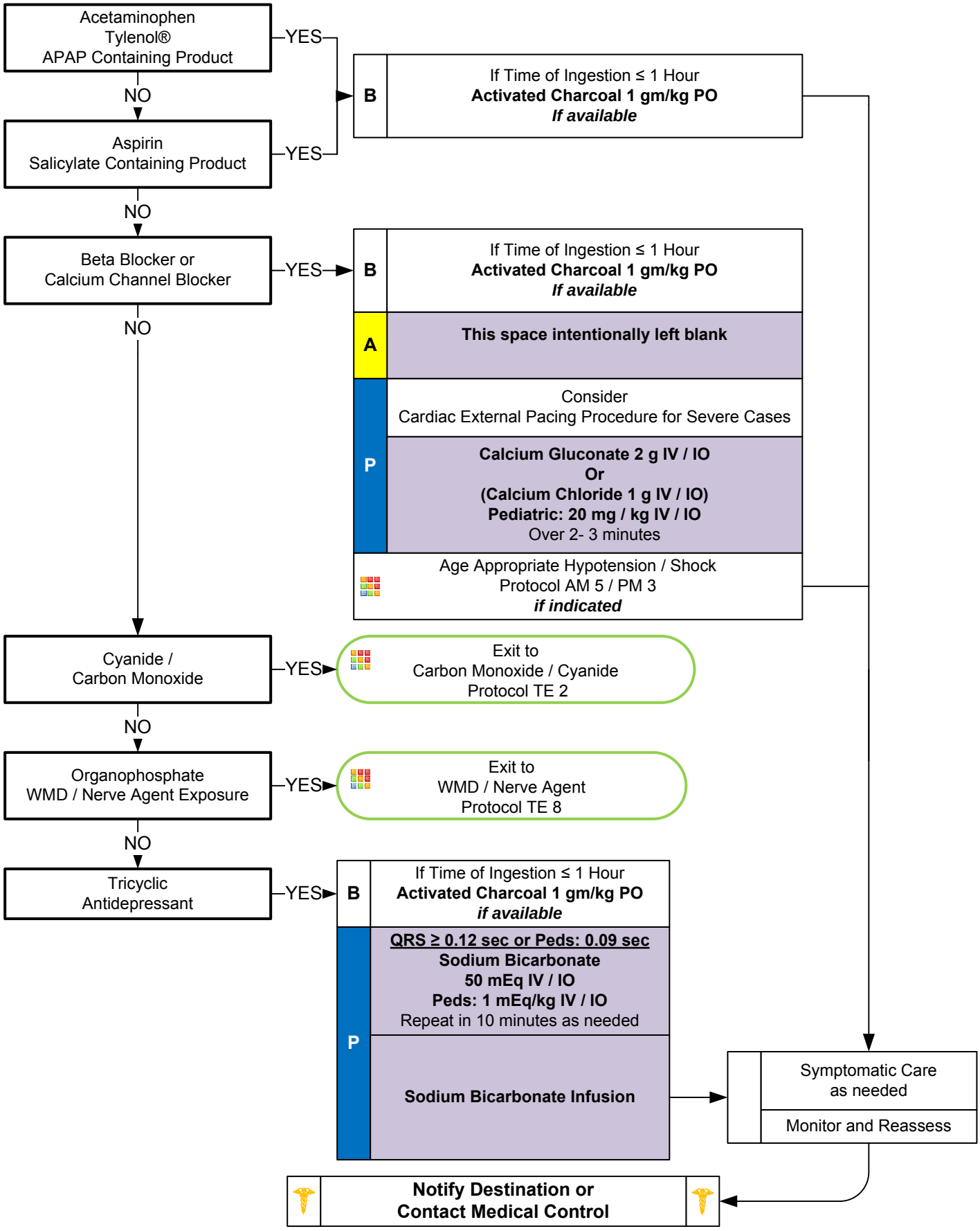
Signs and Symptoms
- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- S.L.U.D.G.E.
- D.U.M.B.B.E.L.S

Differential
- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)



Toxin-Environmental Protocol Section

Overdose / Toxic Ingestion



Overdose / Toxic Ingestion

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Opioids and opiates may require higher doses of Naloxone to improve respiration, in certain circumstances up to 10 mg.**
- **Time of Ingestion:**
  1. Most important aspect is the **TIME OF INGESTION** and the substance and amount ingested and any co-ingestants.
  2. Every effort should be made to elicit this information before leaving the scene.
- **Charcoal Administration:**
  The American Academy of Clinical Toxicology DOES NOT recommend the routine use of charcoal in poisonings.
  1. Consider Charcoal within the FIRST HOUR after ingestion. If a potentially life threatening substance is ingested or extended release agent(s) are involved and ≥ one hour from ingestion contact medical control or Poison Center for direction.
  2. If NG is necessary to administer Charcoal then DO NOT administer unless known to be adsorbed, and airway secured by intubation and ingestion is less than ONE HOUR confirmed and potentially lethal.
  3. Charcoal in general should only be given to a patient who is alert and awake such that they can self-administer the medication.
- **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying other medications or has any weapons.**
- **Pediatric:**
- **Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 11 years and older > 90 mmHg.**
- **Maintenance IV Rate: By weight of child: First 10 kg = 4 mL, Second 10 kg = 2 mL, Additional kg = 1 mL. (Example: 36 kg child: First 10 kg = 40 mL, Second 10 kg = 20 mL, 16 kg remaining at 1 mL each. Total is 76 mL / hour)**
- **Bring bottles, contents, emesis to ED.**
- **S.L.U.D.G.E: Salivation, Lacrimation, Urination, Defecation, GI distress, Emesis**
- **D.U.M.B.B.E.L.S: Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation.**
- **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure
- **Aspirin**: Early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema among other things can take place later.
- **Depressants:** decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
- **Stimulants:** increased HR, increased BP, increased temperature, dilated pupils, seizures
- **Anticholinergic:** increased HR, increased temperature, dilated pupils, mental status changes
- **Cardiac Medications:** dysrhythmias and mental status changes
- **Solvents:** nausea, coughing, vomiting, and mental status changes
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- **Nerve Agent Antidote kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self administration or patient care. These kits may be available as part of the domestic preparedness for Weapons of Mass Destruction.
- **EMR and EMT may administer naloxone by IN route only and may administer from EMS supply. Agency medical director may require Contact of Medical Control prior to administration and may restrict locally.**
- **When appropriate contact the North Carolina Poison Control Center for guidance, reference Policy 18.**
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.

WMD-Nerve Agent Protocol

History
- Exposure to chemical, biologic, radiologic, or nuclear hazard
- Potential exposure to unknown substance/hazard

Signs and Symptoms
- **S**alivation
- **L**acrimation
- **U**rination; increased, loss of control
- **D**efecation / Diarrhea
- **G**I Upset; Abdominal pain / cramping
- **E**mesis
- **M**uscle Twitching
- Seizure Activity
- Respiratory Arrest

Differential
- Nerve agent exposure (e.g., VX, Sarin, Soman, etc.)
- Organophosphate exposure (pesticide)
- Vesicant exposure (e.g., Mustard Gas, etc.)
- Respiratory Irritant Exposure (e.g., Hydrogen Sulfide, Ammonia, Chlorine, etc.)

Call for help / additional resources
Stage until scene safe

Obtain history of exposure
Observe for specific toxidromes
Initiate triage and/or decontamination as indicated.

Seizure Activity
Go to
Seizure Protocol

Symptom Severity

Asymptomatic

Monitor and Reassess
Every 15 minutes for symptoms
Initiate Treatment per Appropriate Arm

Minor Symptoms:
Respiratory Distress + SLUDGEM

A IV / IO Procedure

Nerve Agent Kit IM
2 Doses Rapidly
if available

Major Symptoms:
Altered Mental Status, Seizures, Respiratory Distress, Respiratory Arrest

A IV / IO Procedure

Nerve Agent Kit IM
3 Doses Rapidly
if available

P

Atropine 2 mg IV / IO / IM
Pediatric: See Pearls
IV / IO / IM
Repeat every 3 to 5 minutes until symptoms resolve

Pralidoxime (2PAM)
600 mg IV / IO / IM
Pediatric: 15 – 25 mg / kg
IV / IO / IM
Over 30 minutes

Notify Destination or Contact Medical Control

Toxic-Environmental Protocol Section

Pearls
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Gastrointestinal, Neuro**
- **Follow local HAZMAT protocols for decontamination and use of personal protective equipment.**
- **Adult / Pediatric Atropine Dosing Guides:**
  - **Confirmed attack: Begin with 1 Nerve Agent Kit for patients less than 7 years of age, 2 Nerve Agent Kits from 8 to 14 years of age, and 3 Nerve Agent Kits for patients 15 years of age and over.**
  - **If Triage / MCI issues exhaust supply of Nerve Agent Kits, use pediatric atropines (if available).**
  - **Usual pediatric doses: 0.5 mg ≤ 40 pounds (18 kg), 1 mg dose if patient weighs between 40 to 90 pounds (18 to 40 kg), and 2 mg dose ≥ 90 pounds (≥ 40 kg).**
- **Each Nerve Agent Kit contains 600 mg of Pralidoxime (2-PAM) and 2 mg of Atropine.**
- **Seizure Activity: Any benzodiazepine by any route is acceptable.**
- For patients with major symptoms, there is no limit for atropine dosing.
- Carefully evaluate patients to ensure they not from exposure to another agent (e.g., narcotics, vesicants, etc.)
- The main symptom that the atropine addresses is excessive secretions so atropine should be given until salivation improves.
- EMS personnel, public safety officers and EMR / EMT may carry, self-administer or administer to a patient atropine / pralidoxime by protocol. Agency medical director may require Contact of Medical Control prior to administration.

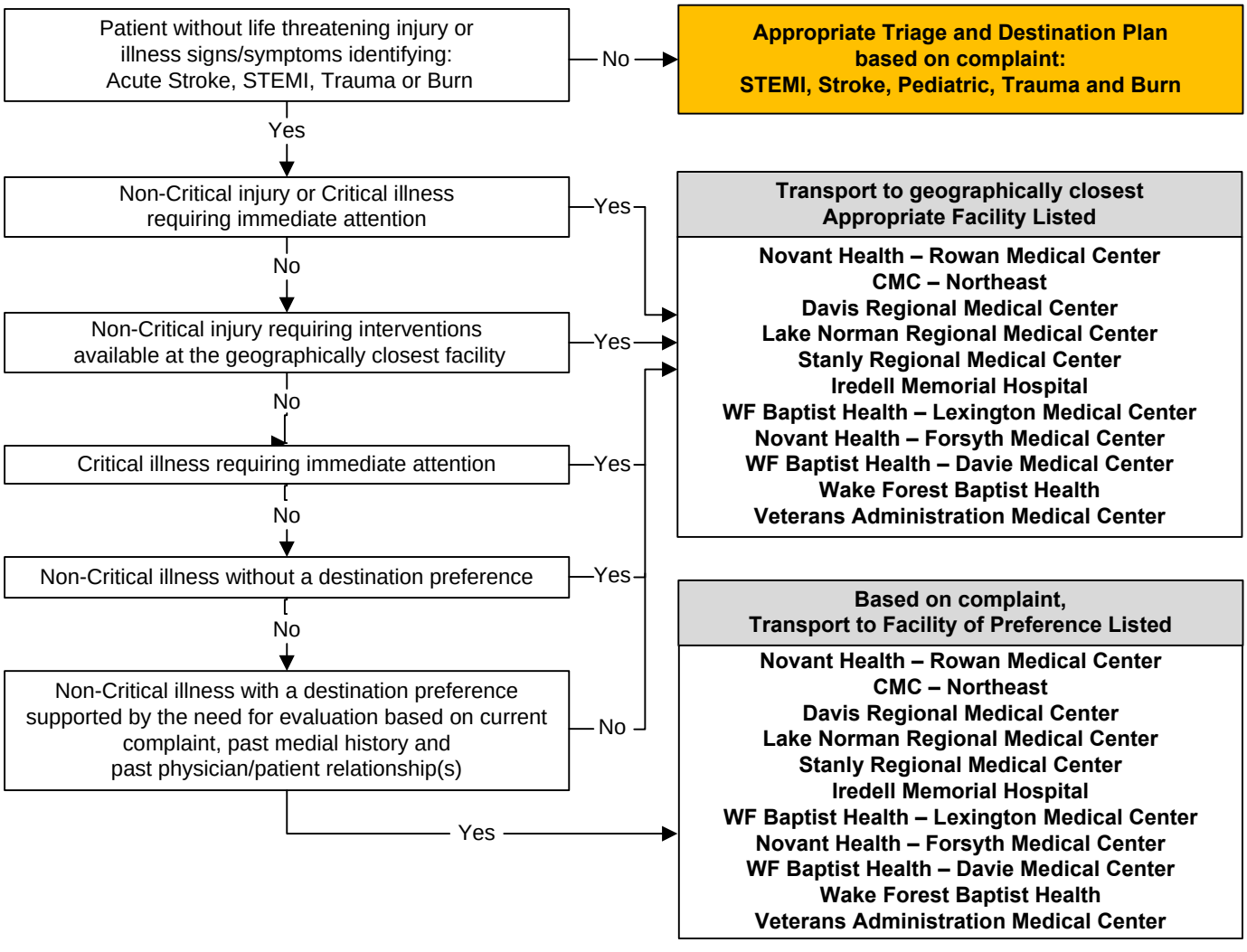
General Medical
EMS Triage and Destination Plan

General Medical Patient

- **A patient with signs and/or symptoms that cannot be categorized into STEMI, Stroke, Pediatric or Trauma and Burn Triage and Destination Plans.**

The purpose of this plan is to:

- Identify general medical patients who call 911 or present to EMS
- Minimize field decision making on transport destinations
- Identify those patients that should be transported to the geographically closest facility based on complaint and facility capabilities
- Identify those patients that may be transported to a geographically distant facility based on complaint and facility capabilities
- Maximize EMS system resource utilization
- Provide quality EMS service and patient care to the EMS Systems citizens
- Continuously evaluate the EMS System based on North Carolinas EMS performance measures.



General Medical EMS Triage and Destination Plan

Pearls and Definitions

- **All General Medical patients should be triaged and transported using this plan. This plan is in effect 24/7/365**
- **Appropriate Facility** = a hospital which provides emergency care 24/7/365 that is determined, based on complaint, to be capable of addressing the primary patient condition.
- **Non-Critical Injury** = Injuries that may be considered time sensitive but not life threatening, i.e. fracture with loss of PMS
- **Critical Illness** = Any potentially life-threatening complaint that does not meet the criteria for STEMI, Stroke, Pediatric or Trauma and Burn Triage and Destination Plans.
- **Non-Critical Illness** = Any non life-threatening complaint (illness) that meets the guidelines for medical necessity of ambulance transport.
- Individual insurance plan requirements should not be a factor in determining the appropriate facility. Consideration of insurance plan requirements may be construed as treatment based on the ability to pay and such practices are prohibited.

Pediatric
EMS Triage and Destination Plan

Pediatric Patient

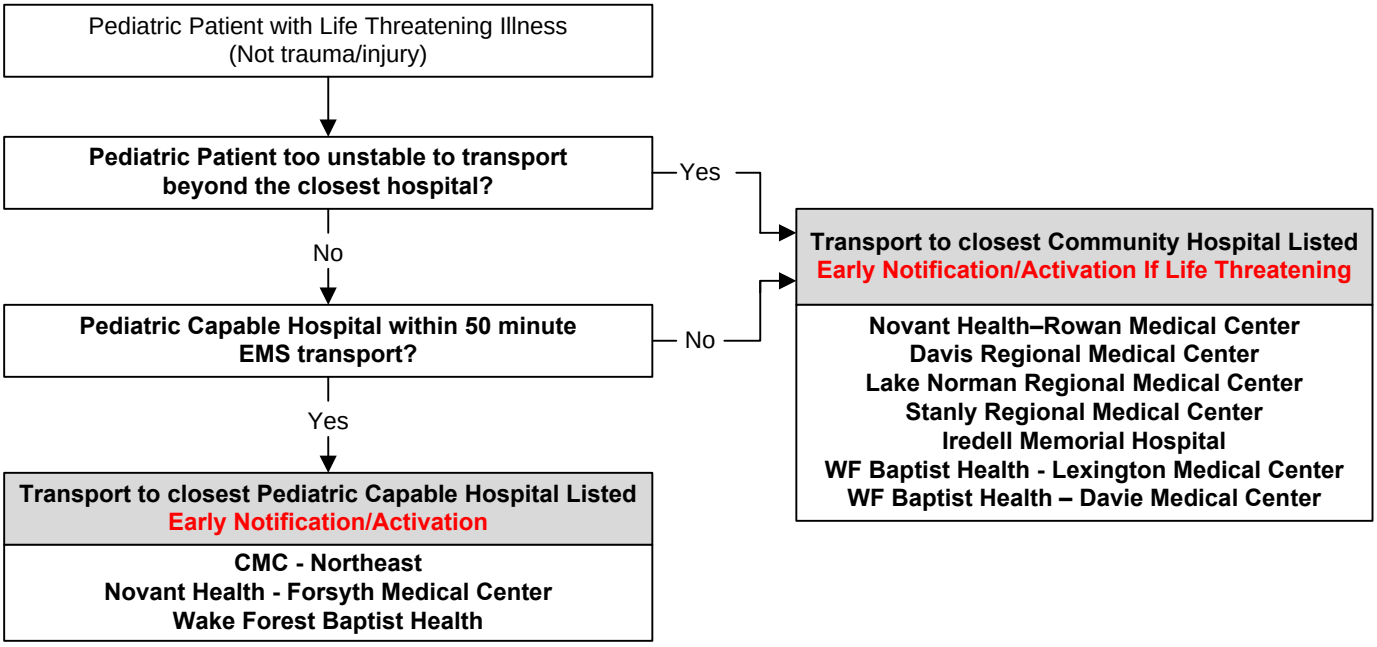
- **Any patient less than 16 years of age with a life-threatening illness (Not Trauma)**

Life Threatening Illness

- **Decreased mental Status (GCS<13)**
- **Non-responsive respiratory Distress**
- **Intubation**
- **Post Cardiac Arrest**
- **Non-responsive Hypotension (shock)**
- **Severe Hypothermia or Hyperthermia**
- **Status Epilepticus**
- **Potential Dangerous Envenomation**
- **Life Threatening Ingestion/ChemicalExposure**
- **Children with Special Healthcare Needs** (and destination choice based on parental request)

The purpose of this plan is to:

- Rapidly identify acute Pediatric patients who call 911 or present to EMS with a life-threatening illness
- Minimize the time from EMS contact to definitive care
- Quickly diagnose patients with pediatric life-threatening illness for EMS treatment and stabilization
- Rapidly identify the best hospital destination based on symptom onset time, vital signs, response to treatment and predicted transport time
- Early activation/notification to the hospital prior to the patient arrival.
- Minimize scene time with a 'load and go" approach
- Provide quality EMS service and patient care to the EMS Community
- Continuously evaluate the EMS System based on North Carolinas EMS performance measures



Pediatric EMS Triage and Destination Plan

Pearls and Definitions

- **All Pediatric patients with a life threatening illness must be triaged and transported using this plan. This plan is in effect 24/7/365**
- **The Trauma and Burn Triage and Destination Plan should be used for all injured patients regardless of age**
- All patient care is based on EMS Suspected Stroke Protocol
- **Pediatric Capable Hospital** = a hospital which provides emergency and pediatric intensive care capability including but not limited to:
  - Emergency Department staffed 24 hours per day with board certified Emergency Physicians.
  - An inpatient Pediatric Intensive Care Unit (with a physician pediatric intensivist available in-house or on call 24/7/365)
  - Accepts all patients regardless of bed availability
  - Provides outcome and performance measure feedback to the EMS including case review
- **Community Hospital** = a local hospital within the EMS Systems service area which provides emergency care but does not meet the criteria of a Pediatric Capable Hospital
- **Pediatric Specialty Care Transport Program** = an air or ground based specialty care transport program that has specific pediatric training and equipment addressing the needs of a pediatric patient that can assume care of a pediatric patient from EMS or a Community hospital and transport to a Pediatric Capable Hospital.

STEMI
EMS Triage and Destination Plan

STEMI Patient
(ST Elevation Myocardial Infarction)

- **Cardiac Symptoms greater than 15 minutes and less than 12 hours**

And

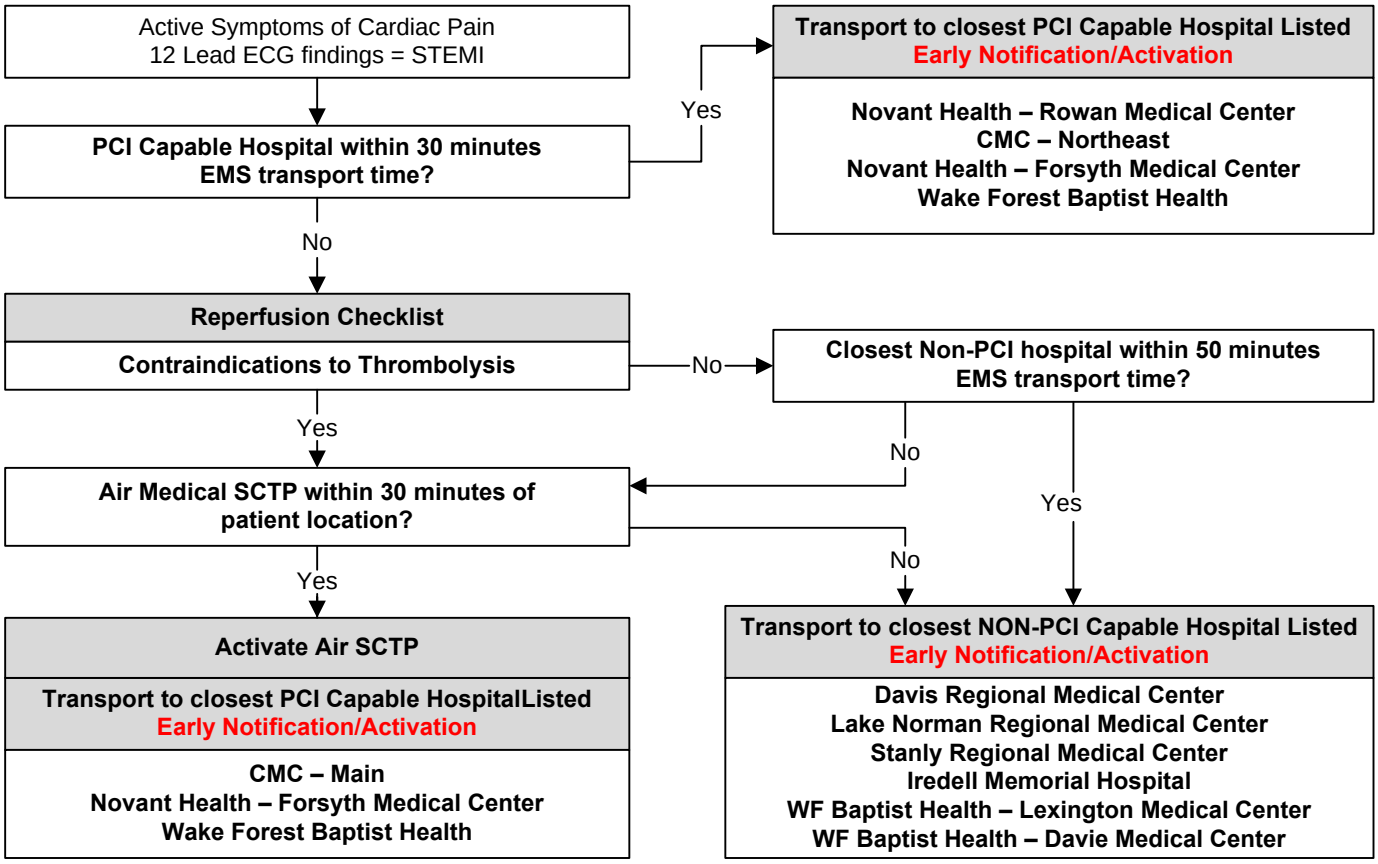
- **12 lead ECG criteria of 1mm ST elevation in 2 or more contiguous leads.**

or

- **Left Bundle Branch Block NOT KNOWN to be present in the past**

The purpose of this plan is to:

- Rapidly identify STEMI patients who call 911 or present to EMS
- Minimize the time from onset of STEMI symptoms to coronary reperfusion
- Quickly diagnose a STEMI by 12 lead ECG
- Complete a reperfusion checklist (unless being transported directly to a PCI hospital) to determine thrombolytic eligibility
- Rapidly identify the best hospital destination based on a symptom onset time, reperfusion checklist and predicted transport time
- Early activation/notification to the hospital prior to the patient arrival
- Minimize scene time to 15 minutes or less (including a 12 lead ECG)
- Provide quality EMS service and patient care to the EMS Systems citizens.
- Continuously evaluate the EMS System based on North Carolinas EMS performance measures



STEMI EMS Triage and Destination Plan

Pearls and Definitions

- **All STEMI patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
- **All patient care is based on EMS Chest Pain and STEMI Protocol**
- **Consider implementing a prehospital thrombolytic program if a STEMI patient cannot reach a hospital within 90 minutes using air or ground EMS transport**
- **PCI (Percutaneous Coronary Intervention) Capable Hospital** = a hospital with an emergency interventional cardiac catheterization laboratory capable of providing the following services to acute STEMI patients. Free standing emergency departments and satellite facilities are not considered part of the PCI hospital.
  - 24/7 PCI capability within 30 minutes of notification (interventional cardiologist present at the start of the case)
  - Single Call Activation number for use by EMS
  - Accepts all patients regardless of bed availability
  - Provides outcome and performance measure feedback to the EMS including case review
- **Non-PCI Hospital** = a local hospital within the EMS Systems service area which provides emergency care including thrombolytic administration to an Acute STEMI patient but does not provide PCI services
- **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acute STEMI patient from EMS or a Non-PCI hospital and transport the patient to a PCI capable hospital

Updated: 09/25/2014

Rowan County EMS System

This plan has been altered from the original NCCEP Protocol by the local EMS Medical Director

2014

Stroke
EMS Triage and Destination Plan

Stroke Patient

- **A patient with symptoms of an acute stroke as identified by the EMS Stroke Screen**

Time of Symptom Onset

- **Defined as the last witnessed time the patient was symptom free (i.e. the time of onset for a patient awakening with stroke symptoms would be the last time he/she was known to be symptom free before the sleep period)**

The purpose of this plan is to:

- Rapidly identify acute Stroke patients who call 911 or present to EMS
- Minimize the time from onset of Stroke symptoms to definitive care
- Quickly diagnose a Stroke using validated EMS Stroke Screen
- Complete a reperfusion checklist (unless being transported directly to a Stroke Capable Hospital) to determine thrombolytic eligibility
- Rapidly identify the best hospital destination based on symptom onset time, reperfusion checklist, and predicted transport time
- Early activation/notification to the hospital prior to the patient arrival
- Minimize scene time to 10 minutes or less
- Provide quality EMS service and patient care to the EMS Systems citizens
- Continuously evaluate the EMS System based on North Carolinas Stroke EMS performance measures.

Symptoms of Acute Stroke
Positive Stroke Screen

Stroke Center or Stroke Capable Hospital within 2 hours from onset of patients symptoms and no greater than 50 minutes EMS transport time?

Yes

Transport to closest Primary Stroke Center or Stroke Capable Hospital Listed
Early Notification/Activation

Novant Health – Rowan Medical Center
CMC – Northeast
Lake Norman Regional Medical Center
Iredell Memorial Hospital
Novant Health – Forsyth Medical Center
Wake Forest Baptist Health

No

Reperfusion Checklist

Contraindications to Thrombolysis

Yes

Air Medial SCTP within 30 minutes of patients location and patient clearly a NEW onset stroke patient?

No

Transport to closest Community Hospital Listed
Early Notification/Activation

Davis Regional Medical Center
Lake Norman Regional Medical Center
Stanly Regional Medical Center
Iredell Memorial Hospital
WF Baptist Health – Lexington Medical Center
WF Baptist Health – Davie Medical Center

Yes

Consider Activating Air or Ground SCTP

Transport to closest Primary Stroke Center Listed
Early Notification/Activation

Novant Health – Rowan Medical Center
CMC – Northeast
Lake Norman Regional Medical Center
Iredell Memorial Hospital
Novant Health – Forsyth Medical Center
Wake Forest Baptist Health

Stroke EMS Triage and Destination Plan

Pearls and Definitions

- **All Stroke patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
- All patient care is based on EMS Suspected Stroke Protocol
- **Primary Stroke Center** = a hospital that is currently accredited by the Joint Commission as a Primary Stroke Center. Free standing emergency departments and satellite facilities are not considered part of the Primary Stroke Center.
- **Stroke Capable Hospital** = a hospital which provides emergency care with a commitment to Stroke and the following capabilities:
  - CT availability with in-house technician availability 24/7/365
  - Ability to rapidly evaluate an acute stroke patient to identify patients who would benefit from thrombolytic administration
  - Ability and willingness to administer thrombolytic agents to eligible acute Stroke patients.
  - Accepts all patients regardless of bed availability
  - Provides outcome and performance measure feedback to the EMS including case review
- **Community Hospital** = a local hospital within the EMS Systems service area which provides emergency care but does not meet the criteria for a Primary Stroke Center or Stroke Capable Hospital
- **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acute stroke patient from EMS or a hospital and transport the patient to a Primary Stroke Center.

Trauma and Burn
EMS Triage and Destination Plan

Trauma or Burn Patient = Any patient (regardless of age) with significant injury or burn

The purpose of this plan is to:

- Rapidly identify injured or burned patients who call 911 or present to EMS
- Minimize the time from injury to definitive care for critical injuries or burns
- Quickly identify life or limb threatening injuries for EMS treatment and stabilization
- Rapidly identify the best hospital destination based on time of injury and predicted transport time
- Early activation/notification to the hospital of a critically injured or burned patient prior to patient arrival
- Minimize scene time to 10 minutes or less from patient extrication with a 'load and go" approach
- Provide quality EMS service and patient care to the EMS Systems citizens.
- Continuously evaluate the EMS System based on North Carolinas EMS performance measures.

Acutely injured or Burned Patient

Evidence of extreme shock or un-manageable airway — Yes → **Transport to Nearest Hospital for Stabilization Unless minimal Additional time to a Trauma Center**

No

Any Abnormal Vital Signs?

- Glasgow Coma Score: <13 or intubated
- Systolic Blood Pressure : <90 mmHg
- Respiratory Rate: <10 or >29 breaths per minute (<20 in infant age<1 year)

Yes → **Trauma center (Burn Center for isolated Burn Injury) within 45 minutes of EMS Transport**

No

Critical injury by Assessment?

- Penetrating injury to head, neck, torso or extremities proximal to elbow and knee
- Flail chest or Pneumothorax
- Two or more proximal long bone fractures
- Crushed, degloved or mangled extremity
- Amputation proximal to wrist and ankle
- Pelvic fracture
- Visibily open or depressed skull fracture
- Paralysis
- Critical or Serious burns (per EMS Burn Protocol)

Yes → **Air Medical SCTP within 30 minutes of patients location or helipad?**

No

Yes

Special Considerations?

- Anticoagulation and bleeding disorders
- Pregnancy >20 weeks

Yes → **Activate Air or Ground SCTP**

Transport to closest Trauma Center (Burn Center for isolated burn)

- Choose a Level 3 if EMS transport time is less than 30 minutes compared to a Level 1 or 2 Trauma Center

Early Notification/Activation

CMC – Northeast
Wake Forest Baptist Health
CMC – Main

No

Significant Mechanism?

- Falls: Adults >20 ft, Children >10 ft
- MVC: intrusion >12 inches occupant side
  >18 inches any side
  Ejection
  Death in same vehicle
  Vehicle telemetry with high risk injury
- Auto vs pedestrian/bicyclist thrown, run over
- Motorcycle crash >20 mph

Transport to closest Community Hospital Listed Unless Trauma Center can be reached in a near equal time

Early Notification/Activation

Novant Health – Rowan Medical Center
Davis Regional Medical Center
Lake Norman Regional Medical Center
Stanly Regional Medical Center
Iredell Memorial Hospital
WF Baptist Health – Lexington Medical Center
WF Baptist Health – Davie Medical Center

Trauma and Burn EMS Triage and Destination Plan

Pearls and Definitions

- **All Injury and Burn patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
- All patient care is based on EMS Trauma Protocols
- **Designated Trauma Center** = a hospital that is currently designated as a Trauma Center by the North Carolina Office of Emergency Medical Services. Trauma Centers are designated as Level 1, 2, or 3 with Level 1 being the highest possible designation. Free standing emergency departments and satellite facilities are not considered part of the Trauma Center
- **Burn Center** = an ABA verified burn Center co-located with a designated Trauma Center
- **Community Hospital** = a local hospital within the EMS Systems service area which provides emergency care but has not been designated as a Trauma Center
- **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acutely injured patient from EMS or a Community Hospital and transport the patient to a Designated Trauma Center

Drug List

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Drug	Adult	Pediatric
Acetaminophen (Tylenol) **NCCEP Protocol:** ✱ 7- Pain Control-Adult ✱ 46-Pain Control-Pediatric ✱ 72-Fever **Indications/Contraindications:** • Indicated for pain and fever control • Avoid in patients with severe liver disease	• 1000 mg po	• **See Color Coded List** • 15 mg/kg po
Adenosine (Adenocard) **NCCEP Protocol:** ✱ 16-Adult Tachycardia Narrow Complex ✱ 17-Adult Tachycardia Wide Complex ✱ 52-Pediatric Tachycardia **Indications/Contraindications:** • Specifically for treatment or diagnosis of Supraventricular Tachycardia	• 6 mg IV push over 1-3 seconds. If no effect after 1-2 minutes, • Repeat with 12 mg IV push over 1-3 seconds. • Repeat once if necessary • (use stopcock and 20 ml Normal Saline flush with each dose)	• 0.1 mg/kg IV (Max 6 mg) push over 1-3 seconds. If no effect after 1-2 minutes, • Repeat with 0.2 mg/kg IV (Max 12 mg) push over 1-3 seconds. • Repeat once if necessary • (use stopcock and Normal Saline flush with each dose)
Albuterol Beta-Agonist **NCCEP Protocol:** ✱ 24- Allergic Reaction Anaphylaxis ✱ 26-COPD Asthma ✱ 56-Pediatric Allergic Reaction ✱ 61-Pediatric Respiratory Distress **Indications/Contraindications:** • Beta-Agonist nebulized treatment for use in respiratory distress with bronchospasm	• 2.5-5.0 mg (3cc) in nebulizer continuously x 3 doses, if no history of cardiac disease and Heart Rate ≤ 150.	• **See Color Coded List** • 2.5mg (3cc) in nebulizer continuously x 3 doses, if no history of cardiac disease and Heart Rate < 200.

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Drug	Adult	Pediatric
Amiodarone (Cordarone) **NCCEP Protocol:** ✱ 17-Adult Tachycardia Wide Complex ✱ 18-Adult Shockable ✱ 52-Pediatric Tachycardia ✱ 53-Pediatric Shockable ✱ 54-Pediatric Post Resuscitation **Indications/Contraindications:** • Antiarrhythmic used mainly in wide complex tachycardia and ventricular fibrillation. • Avoid in patients with heart block or profound bradycardia. • Contraindicated in patients with iodine hypersensitivity	V-fib / pulseless V-tach • 300 mg IV push • Repeat dose of 150 mg IV push for recurrent episodes V-tach with a pulse • 150 mg in 100cc D5W over 10 min	V-fib / pulseless V-tach • 5 mg/kg IV push over 5 minutes • May repeat up to 15 mg/kg IV V-tach with a pulse • 5 mg/kg IV push over 5 minutes • May repeat up to 15 mg/kg IV • Avoid in Length Tape Color Pink
Aspirin **NCCEP Protocol:** ✱ 7-Pain Control Adult ✱ 14-Chest Pain and STEMI **Indications/Contraindications:** • An antiplatelet drug for use in cardiac chest pain	• 81 mg chewable (baby) Aspirin Give 4 tablets to equal usual adult dose.	Ø
Atropine **NCCEP Protocol:** ✱ 12-Bradycardia Pulse Present ✱ 49-Pediatric Bradycardia ✱ 84-WMD Nerve Agent **Indications/Contraindications:** • Anticholinergic drug used in bradycardias. • In Organophosphate toxicity, large doses may be required (>10 mg)	Bradycardia • 0.5 - 1.0 mg IV every 3 – 5 minutes up to 3 mg. Organophosphate • 1-2 mg IM or IV otherwise as per medical control	• **See Color Coded List** Bradycardia • 0.02 mg/kg IV, IO (Max 0.5 mg per dose, max total dose 1 mg IV) • (Min 0.1 mg) per dose • May repeat in 3 - 5 minutes Organophosphate • 0.02 mg/kg IV or IO otherwise as per medical control

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Drug	Adult	Pediatric
Atropine and Pralidoxime Auto-Injector **Nerve Agent Kit** **NCCEP Protocol:** ✱ 84-WMD Nerve Agent **Indications/Contraindications:** • Antidote for Nerve Agents or Organophosphate Overdose	• One auto-injector then per medical control	• **See Color Coded List** • One pediatric auto-injector then as per medical control
Calcium Chloride **NCCEP Protocol:** ✱ 28-Dialysis Renal Failure ✱ 31-Overdose Toxic Ingestion ✱ 60-Ped OD Toxic Ingestion ✱ 83-Marine Envenomations ✱ 88-Crush Syndrome **Indications/Contraindications:** • Indicated for severe hyperkalemia	• 1 gm IV/IO • Avoid use if pt is taking digoxin	• **See Color Coded List** • 20 mg/kg IV or IO slowly
Dextrose 10%, 25%, 50% **Glucose solutions** **NCCEP Protocol:** ✱ Multiple **Indications/Contraindications:** • Use in unconscious or hypoglycemic states	See protocol for concentration and dosing	• **See Color Coded List** See protocol for concentration and dosing

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Drug	Adult	Pediatric
Diazepam (Valium) Benzodiazepene **NCCEP Protocol:** ✱ 32-Seizure ✱ 39-Obstetrical Emergency ✱ 62-Pediatric Seizure **Indications/Contraindications:** • Seizure control • Mild Sedation	• 4 mg IV initially then 2 mg IV every 3 - 5 minutes up to 10 mg max unless med control dictates • Do not administer IM. The drug is not absorbed. • 10 mg Rectally if unable to obtain an IV.	• **See Color Coded List** • 0.1 - 0.3 mg/kg IV/IO • (Max dose 4 mg IV, IO) • O.5 mg/kg rectally (Dia-Stat) • (Max dose 10 mg rectally) • Repeat as directed by medical control.
Dilaudid (Hydromorphone) Narcotic Analgesic **NCCEP Protocol:** ✱ 7-Pain Control Adult ✱ 46-Pain Control Pediatric **Indications/Contraindications:** • Narcotic pain relief • Antianxiety • Possible beneficial effect in pulmonary edema • Avoid use if BP < 110	• 1-2 mg IM/IV/IO bolus then 1 mg IM/IV/IO every 20-30 minutes until a maximum of 5 mg or clinical improvement	• **See Color Coded List** • 0.015 mg/kg IM/IV/IO single bolus only (Max 2 mg) • Minimum Age = 5 years or 20 kg)
Diltiazem (Cardizem) Calcium Channel Blocker **NCCEP Protocol:** ✱ 16-Adult Tachycardia Narro Complex **Indications/Contraindications:** • Calcium channel blocker used to treat narrow complex SVT • Contraindicated in patients with heart block, ventricular tachycardia, an/or acute MI	• 0.25 mg/kg IV over 2 minutes	Ø

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Drug	Adult	Pediatric
Diphenhydramine (Benadryl) **NCCEP Protocol:** ✱ 24-Allergic Reaction Anaphylaxis ✱ 56-Pediatric Allergic Reaction **Indications/Contraindications:** • Antihistamine for control of allergic reactions	• 25-50 mg IV/IO/IM/PO	• **See Color Coded List** • 1 mg/kg IV/IO/IM • Do not give in infants < 3 mo
Dopamine **NCCEP Protocol:** ✱ Multiple **Indications/Contraindications:** • A vasopressor used in shock or hypotensive states	• 2 - 20 micrograms/kg/min IV/IO titrate to BP systolic of 90 mmHg	• **See Color Coded List** • 2 - 20 micrograms/kg/min IV or IO, titrate to BP systolic appropriate for age
Epinephrine 1:1,000 **NCCEP Protocol:** ✱ Multiple **Indications/Contraindications:** • Vasopressor used in allergic reactions or anaphylaxis	• 0.3 mg IM (if age < 50 yrs) • 0.15 mg IM (if age > 50 yrs) **Nebulized Epinephrine** • 1 mg mixed with 2 ml of Normal Saline	• **See Color Coded List** • 0.01 mg/kg IM • (Max dose 0.3 mg) **Nebulized Epinephrine** • 1 mg mixed with 2 ml of Normal Saline
Epinephrine 1:10,000 **NCCEP Protocol:** ✱ Multiple **Indications/Contraindications:** • Vasopressor used in cardiac arrest.	• 1.0 mg IV/IO • Repeat every 3 - 5 minutes until observe response	• **See Color Coded List** • 0.01 mg/kg IV or IO • (Max dose 1 mg) • Repeat every 3 - 5 minutes until observe response

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Drug	Adult	Pediatric
Etomidate (Amidate) **NCCEP Protocol:** ✱ 4-Airway Rapid Sequence Intubation ✱ 20-Induced Hypothermia **Indications/Contraindications:** • Hypnotic sedative used in Drug Assisted Intubation	• 0.3 mg/kg IV/IO • Usual adult dose = 20 mg	Ø
Famotidine (Pepcid) Histamine-2 Blocker **NCCEP Protocol:** ✱ 24-Adult Allergic Reaction ✱ 56-Pediatric Allergic Reaction **Indications/Contraindications:** • Medication used to control stomach acid and to assist in severe allergic reactions	• 20 mg IV • 20-40 mg PO	• 0.5 mg/kg IV / PO • Maximum 10mg
Furosemide (Lasix) **NCCEP Protocol:** ✱ 15-CHF Pulmonary Edema ✱ 50-Pediatric CHF Pulmonary Edema **Indications/Contraindications:** • Diuretic for pulmonary edema or CHF but no proven benefit in prehospital care	• 20 mg IV or dose to equal patient's normal single home PO dose (Maximum dose = 160 mg)	• Requires Medical Control Order • 1 mg/kg IV

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Drug	Adult	Pediatric
Glucagon **NCCEP Protocol:** ✱ 27-Diabetic; Adult ✱ 31-Overdose Toxic Ingestion ✱ 58-Pediatric Diabetic ✱ 60-Ped OD Toxic Ingestion **Indications/Contraindications:** • Drug acting to release glucose into blood stream by glycogen breakdown • Use in patients with no IV access	• 1 - 2 mg IM • Repeat blood glucose measurement in 15 minutes, if ≤ 69 mg/dl repeat dose.	• **See Color Coded List** • 0.1 mg/kg IM • Repeat blood glucose measurement in 15 minutes, if ≤ 69 mg/dl repeat dose.
Glucose Oral **Glucose Solutions** **NCCEP Protocol:** ✱ 27-Diabetic; Adult ✱ 58-Pediatric Diabetic **Indications/Contraindications:** • Use in conscious hypoglycemic states	• One tube or packet • Repeat based on blood glucose results	• **See Color Coded List** • One Tube or packet • Repeat based on blood glucose result • Consider patient's ability to swallow and follow directions based on age
Haloperidol **(Haldol)** **Phenothiazine Preperation** **NCCEP Protocol:** ✱ 6-Behavioral **Indications/Contraindications:** • Medication to assist with sedation of agitated patients	• 2.5-10 mg IM • May repeat as per Medical Control	Ø

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Drug	Adult	Pediatric
Ibuprofen (Motrin) Non-steroidal Anti-inflammatory Drug **NCCEP Protocol:** ✱ 72-Fever ✱ 7-Pain Control Adult ✱ 46-Pain Control Pediatric **Indications/Contraindications:** • Avoid NSAIDS in women who are pregnant or could be pregnant. • A nonsteroidal anti-inflammatory drug (NSAID) used for pain and fever control. • Not to be used in patients with history of GI Bleeding (ulcers) or renal insufficiency. • Not to be used in patients with allergies to aspirin or other NSAID drugs • Avoid in patients currently taking anticoagulants, such as coumadin.	• 400-800 mg po	• **See Color Coded List** • 10 mg/kg po • Do not use in patients 6 months of age or younger
Ipratropium (Atrovent) **NCCEP Protocol:** ✱ 24-Allergic Reaction Anaphylaxis ✱ 26-COPD Asthma ✱ 56-Pediatric Allergic Reaction ✱ 61-Pediatric Respiratory Distress **Indications/Contraindications:** • Medication used in addition to albuterol to assist in patients with asthma and COPD	• 2 puffs per dose of MDI (18 mcg/spray) --- OR --- • 500 mcg (0.5mg) per nebulizer treatment	• Use in Pediatrics as a combined Therapy with a Beta Agonist such as Albuterol • 2 puffs per dose of MDI (18 mcg/spray) --- OR --- • 500 mcg (0.5mg) per nebulizer treatment

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Drug	Adult	Pediatric
Ketamine **NCCEP Protocol:** ✱ 3-Airway Drug Assisted Intubation ✱ 20-Induced Hypothermia **Indications/Contraindications:** • Hypnotic used in Drug Assisted Intubation	• 1-2 mg/kg IV	Ø
Ketorolac (Toradol) Non-steroidal Anti-inflammatory Drug **NCCEP Protocol:** ✱ 7-Pain Control Adult ✱ 46-Pediatric Pain Control **Indications/Contraindications:** • Avoid NSAIDS in women who are pregnant or could be pregnant • A nonsteroidal anti-inflammatory drug used for pain control. • Not to be used in patients with history of GI bleeding (ulcers), renal insufficiency, or in patients who may need immediate surgical intervention (i.e. obvious fractures). • Not to be used in patients with allergies to aspirin or other NSAID drugs such as motrin • Avoid in patients currently taking anticoagulants such as coumadin	• 30 mg IV / IO or 60 mg IM	• 0.5 mg/kg IV / IO / IM – Maximum 30 mg

Drug List

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Drug	Adult	Pediatric
Levalbuterol (Xopenex) Beta-Agonist **NCCEP Protocol:** ✱ 30-Respiratory Distress ✱ 46-Pediatric Respiratory Distress ✱ 52-Drowning **Indications/Contraindications:** • Beta-Agonist nebulized treatment for use in respiratory distress with bronchospasm	• 0.63-1.25 mg (3cc) in nebulizer continuously x 3 doses, if no history of cardiac disease and Heart Rate ≤ 150.	• **See Color Coded List** • 0.31-0.63 mg (3cc) in nebulizer continuously x 3 doses, if no history of cardiac disease and Heart Rate < 200.
Lidocaine **NCCEP Protocol:** ✱ 4-Airway Rapid Sequence Intubation ✱ 18-Shockable Rhythm ✱ 53-Pediatric Shockable Rhythm **Indications/Contraindications:** • Antiarrhythmic used for control of ventricular dysrrythmias • Anesthetic used during intubation to prevent elevated intracranial pressures during intubation	• 1.5 mg/kg IV / IO bolus up to 3mg/kg max bolus dose • Initial Dose 0.75 mg/kg in patients ≥ 60 years of age. • Repeat 1/2 initial dose in 10 minutes. • No Drip Administration	• **See Color Coded List** • 1 mg/kg IV, IO bolus – Maximum 100mg per bolus • Repeat 1/2 initial bolus in 10 minutes – Maximum 3mg/kg total • No Drip Administration
Lorazepam (Ativan) Benzodiazepene **NCCEP Protocol:** ✱ Multiple protocols **Indications/Contraindications:** Benzodiazepine used to control seizures and sedation	2-4 mg IV/IM May repeat q 5-10 minutes if seizures not controlled	• **See Color Coded List** • 0.05-0.1 mg/kg IV/IM (max 2 mg/dose) • May repeat q 5-10 minutes (Maximum of 3 doses) if seizures not controlled

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Drug	Adult	Pediatric
Magnesium Sulfate **NCCEP Protocol:** ✱ Multiple **Indications/Contraindications:** • Elemental electrolyte used to treat eclampsia during the third trimester of pregnancy. • A smooth muscle relaxor used in refractory respiratory distress resistent to beta-agonists	• 2 g slow IV / IO – over 10 minutes • dose may be repeated once **Obstetrical Seizure:** • 2 g IV / IO over 2-3 minutes • Dose may be repeated once	• 40 mg/kg slow IV over 20 minutes (Max 2 gms) • dose may be repeated once
Methylprednisolone (Solu-medrol) Steroid Preparation **NCCEP Protocol:** ✱ 24-Allergic Reaction Anaphylaxis ✱ 26-COPD Asthma ✱ 56-Pediatric Allergic Reaction ✱ 61-Pediatric Respiratory Distress **Indications/Contraindications:** • Steroid used in respiratory distress to reverse inflammatory and allergic reactions	• 125 mg IV • May be given IM if necessary	• **See Color Coded List** • 2 mg/kg IV / IO (Max 125 mg) • IM if necessary
Midazolam (Versed) Benzodiazepine **NCCEP Protocol:** ✱ Multiple protocols **Indications/Contraindications:** • Benzodiazepine used to control seizures and sedation • Quick acting Benzodiazepine • Preferred over Valium for IM use • Use with caution if BP < 110	• 0.5-2 mg IV slowly over 2-3 minutes. May slowly titrate dose up to 5 mg total if needed. Usual total dose: 2.5-5 mg • 1-2 mg Nasally via Atomizer. Usual total dose: 2-5 mg • IM dosage: 5 mg	• **See Color Coded List** • 0.1-0.2 mg/kg IV or IO slowly over 2 – 3 minutes (Max 2 mg)

Drug List

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Drug	Adult	Pediatric
Morphine Sulfate **Narcotic Analgesic** **NCCEP Protocol:** ✱ Multiple **Indications/Contraindications:** • Narcotic pain relief • Antianxiety • Possible beneficial effect in pulmonary edema • Avoid use if BP < 110	• 4 mg IM/IV/IO bolus then 2 mg IM/IV/IO every 5-10 minutes until a maximum of 10 mg or clinical improvement	• **See Color Coded List** • 0.1 mg/kg IV or IO single bolus only (Max 5 mg) May repeat every 5 minutes Maximum single dose 5 mg Maximum dose 10 mg
Naloxone **(Narcan)** **Narcotic Antagonoist** **NCCEP Protocol:** ✱ 31-Overdose Toxic Ingestion ✱ 60- Ped OD Toxic Ingestion **Indications/Contraindications:** • Narcotic antagonist	• 0.5 - 2 mg IV bolus titrated to patient's respiratory response • May be given IM or IN if unable to establish IV in a known narcotic overdose	• **See Color Coded List** • 0.1 mg/kg IV / IN or IO (Max 2 mg) • May repeat in 5 minutes if no effect.
Normal Saline **Crystalloid Solutions** **NCCEP Protocol:** ✱ Multiple **Indications/Contraindications:** • The IV fluid of choice for access or volume infusion	• KVO for IV access • Bolus in 250-500 ml for cardiac • Bolus in 500 to 1000 ml amount for volume • Bolus in 1000 ml amount for burns or electrical injuries. See Burn Protocol or Reference Materials for IV rates.	• **See Color Coded List** • KVO for IV or IO access • Bolus in 20ml/kg for volume (May be repeated x 3) • See Burn Protocol or Reference Materials for IV rates.

Drug List

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Drug	Adult	Pediatric
Nitroglycerin **NCCEP Protocol:** ✱ 14-Chest Pain and STEMI ✱ 15-CHF Pulmonary Edema **Indications/Contraindications:** • Vasodilator used in anginal syndromes, CHF and Hypertension.	Chest Pain • 1 spray/tablet SL every 5 minutes until painfree or 3 doses • If SBP < 100, contact medical control • 1" paste after pain free or 3 doses Pulmonary Edema • 1 spray/tablet SL every 1-2 minutes if BP >110 Systolic • Mean Arterial Blood Pressure should not be decreased more than 30% Hypertension • 1 spray/tablet SL every 1-2 minutes until BP <110 Diastolic • Mean Arterial Blood Pressure should not be decreased more than 30%	Ø
Ondansetron (Zofran) Anti-emetic **NCCEP Protocol:** ✱ 15-Abdominal Pain ✱ 21-Chest Pain and STEMI ✱ 37-Vomiting and Diarrhea **Indications/Contraindications:** • Anti-Emetic used to control Nausea and/or Vomiting • Ondansetron (Zofrin) is the recommended Anti-emetic for EMS use since it is associated with significantly less side effects and sedation.	• 4 mg IV / IO / IM / PO / ODT	• 0.15 mg/kg IV / IO / IM (Max 4 mg) • 0.2 mg/kg PO / ODT (Max 4 mg)

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Drug	Adult	Pediatric
Oxygen **NCCEP Protocol:** * Multiple **Indications/Contraindications:** • Useful in any condition with cardiac work load, respiratory distress, or illness or injury resulting in altered ventilation and/or perfusion. • Required for pre-oxygenation whenever possible prior to intubation.	• 1-4 liters/min via nasal cannula • 6-15 liters/min via NRB mask • 15 liters via BVM	• 1-4 liters/min via nasal cannula • 6-15 liters/min via NRB mask • 15 liters via BVM

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Drug	Adult	Pediatric
Oxymetazoline (Afrin or Otrivin) Nasal Decongestant Spray **NCCEP Protocol:** ✱ 71-Epistaxis **Indications/Contraindications:** • Vasoconstrictor used with nasal intubation and epistaxis • Relative Contraindication is significant hypertension	• 2 sprays in affected nostril	• **See Color Coded List** • 1-2 sprays in affected nostril
Rocuronium **NCCEP Protocol:** ✱ 4-Airway Rapid Sequence Intubation ✱ 19-Post Resuscitation ✱ 20-Induced Hypothermia **Indications/Contraindications:** • Non-depolarizing paralytic agent used as a component of drug assisted intubation (Rapid Sequence Intubation), when succinylcholine is contraindicated. • Onset of action is longer than succinylcholine, up to 3 minutes, patient will NOT defasciculate.	• 1 mg/kg IV / IO • May repeat per protocol	Ø
Sodium Bicarbonate **NCCEP Protocol:** ✱ 28-Dialysis Renal Failure ✱ 31-Overdose Toxic Ingestion ✱ 60-Ped OD Toxic Ingestion ✱ 88-Crush Syndrome **Indications/Contraindications:** • A buffer used in acidosis to increase the pH in Cardiac Arrest or Tricyclic Overdose.	• 50 mEq IV / IO initially, then 25 mEq IV / IO every 10 minutes as needed • In TCA (tricyclic), 50 mEq bolus, then 100 mEq in 1 liter of NS for infusion at 200 ml/hr	• **See Color Coded List** • 1 meq/kg IV, IO initally, then 1/2 meq/kg IV every 10 minutes as needed. • TCA (trycyclic) overdose per medical control.

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Drug	Adult	Pediatric
Succinylcholine Paralytic Agent **NCCEP Protocol:** ✱ 4-Airway Rapid Sequence Intubation **Indications/Contraindications:** • Paralytic Agent used as a component of Drug Assisted Intubation (Rapid Sequence Intubation) • Avoid in patients with burns >24 hours old, chronic neuromuscular disease (e.g., muscular dystrophy), ESRD, or other situation in which hyperkalemia is likely.	• 1.5 mg/kg IV / IO	Ø
Vasopressin (Pitressin) **NCCEP Protocol:** ✱ 11-Asystole ✱ 18-Shockable Rhythm Adult **Indications/Contraindications:** • Medication used in place of and/or in addition to epinephrine in the setting of ventricular fibrillation/pulsesless ventricular tachycardia	• 40 units IV / IO X 1 as the first or second dose of a vasopressor	Ø

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Drug	Adult	Pediatric
Vecuronium **Paralytic Agent** **NCCEP Protocol:** ✱ 4-Airway Rapid Sequence Intubation ✱ 19-Post Resuscitation ✱ 20-Induced Hypothermia **Indications/Contraindications:** • Long-acting non-depolarizing paralytic agent • Avoid in patients with chronic neuromuscular disease (e.g., muscular dystrophy).	• 0.1 mg/kg IV / IO	Ø
Zemuron **(Rocuronium)** **Paralytic Agent** **NCCEP Protocol:** ✱ 4-Airway Rapid Sequence Intubation ✱ 19-Post Resuscitation ✱ 20-Induced Hypothermia **Indications/Contraindications:** • Paralytic • Avoid in patients with chronic neuromuscular disease (e.g., muscular dystrophy).	• 0.6 mg/kg IV / IO • Recommended adult dose for prehospital intubation = 10mg	Ø
Antibiotics **Indications:** • **Treat or prevent infections** **Pearls:** • **Report any adverse reaction, i.e. urticaria, nausea/vomiting to Medical Control**	**Adult:** • Varies depending on med • Follow existing orders or label instructions	• Varies depending on med • Follow exist orders or label instructions

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Drug	Adult	Pediatric
Heparin Drip Indications: • Anticoagulation therapy Pearls: • Observe for bleeding	• Follow existing orders or label instructions	• N/A
Magnesium Sulfate Drip Indications: • Hypomagnesium, Torsades de points, Preeclampsia, Eclampsia Pearls: • Dissappearance of knee jerk/patellar reflex indicates toxic level • May cause respiratory depression, hypotension, heart block	• Follow existing orders or label instructions	• N/A
Nitroglycerin Drip Indications: • Chest Pain, CHF, Pulmonary Edema Pearls: • May cause hypotension, headache, flushing • Frequent vital signs are indicated	• Follow existing orders or label instructions • May increase infusion rate by 5-20 mcg/min until: - Systolic BP falls below 100mmHG - Heart Rate increases 20 BPM - Chest Pain is relieved	• N/A

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Drug	Adult	Pediatric
Platelet Glycoprotein IIb / IIIa Inhibitors Indications: • Inhibits platelet aggregation in acute coronary syndrome including PCI Pearls: • Contraindicated: Hypersensitivity, recent surgery, bleeding or bleeding disorders, recent CVA, uncontrolled severe hypertension, hypotension and renal dialysis dependency • SE: Bleeding, CVA, thrombocytopenia, bradycardia and rash	• Variable depending on med, follow existing orders or label instructions	• N/A
Potassium Chloride Indications: • Hypokalemaia Pearls: • Cardiac monitor indicated for rates aboove 10mEq/hr • May cause arrhythmias, nausea, vomiting, phlebitis at IV site	• Follow existing orders or label instructions	• Follow existing orders or label instructions
Thrombolytics (i.e. Urokinase, Streptokinase, TPA) Indications: • To dissolve thrombi Pearls: • IM injections, venipuncture contraindicated during therapy • Many possbile side effects depending on medication. Most common include bleeding, fever, urticaria, hypotension, arrhythmias	• Varies depending on medication • Follow existing orders or label instructions	• Varies depening on medication • Follow existing orders or label instructions

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Drug	Adult	Pediatric
Whole Blood and Components Indications: • Restore circulating volume, replace clotting factors, improve oxygen carrying capacity of blood Pearls: • Discontinue infusion immediately if any of the following occur: fever with or without chills, chest pain, pain at infusion site, lower back pain, hypotension, nausea, flushing, dyspnea, bleeding, blood in urine, shock, absent or decreased urine output. Notify both sending and receiving facilities	• All products should be infused within four hours, whole blood may be as fast as patient can tolerate. Fresh frozen plasma/platelets usually 10 ml/min	• All products should be infused within four hours, whole blood may be as fast as patient can tolerate. Fresh frozen plasma/platelets usually 10ml/min.

Pediatric Color Coded Drug List

Weight 3-5 Kg (Avg 4.0 Kg)

Length < 59.5 cm

Vital Signs

Heart Rate	120-150
Respirations	24-48
BP Systolic	70 (+/-25)

Equipment

ET Tube	2.5 - 3.5
Blade Size	0 - 1

Defibrillation

Defibrillation	8 J, 15 J
Cardioversion	2 J,4 J

Normal Saline 80 ml

Acetaminophen		64 mg
Adenosine	1st Dose-	0.3 mg
	Repeat Dose-	0.6 mg
Afrin Nasal Spray		HOLD
Albuterol		2.5mg
Amiodarone		20 mg
Atropine		0.10 mg
Calcium Chloride		80 mg
Charcoal		N/A
Dextrose 10%		20 ml
Diazepam	(IV)	0.8 mg
	(Rectal)	2.0 mg
Dilaudid		HOLD
Diphenhydramine		6.5 mg
Dopamine (800 mg in 500 cc)		
2	mcg/kg/min	0.3 ml/hr
5	mcg/kg/min	0.9 ml/hr
10	mcg/kg/min	1.7 ml/hr
20	mcg/kg/min	3.3 ml/hr

Epinephrine 1:10,000	0.04 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Epinephrine 1:1000 IM	0.05 mg
Fentanyl	8.0 mcg
Glucagon	0.5 mg
Ibuprofen	N/A
Ipratropium	500 mcg
Levalbuterol	0.31 mg
Lidocaine	4 mg
Lorazepam	0.2 mg
Magnesium Sulfate	200 mg
Methylprednisolone	6.25 mg
Midazolam	0.5 mg
Morphine Sulfate	0.4 mg
Naloxone	0.4 mg
Ondansetron	0.6 mg
Prednisone	4.0 mg
Sodium Bicarbonate	4 mEq

Gray (0-3 months)

Weight 6-7 Kg (Avg 6.5 Kg)

Length 59.5-66.5 cm

Vital Signs

Heart Rate	120-125
Respirations	24-48
BP Systolic	85 (+/-25)

Equipment

ET Tube	3.5
Blade Size	1

Defibrillation

Defibrillation	10 J, 20 J
Cardioversion	2 J, 5 J

Normal Saline 130 ml

Acetaminophen		96 mg
Adenosine	1st Dose-	0.6 mg
	Repeat Dose-	1.2 mg
Afrin Nasal Spray		HOLD
Albuterol		2.5 mg
Atropine		0.13 mg
Amiodarone		30 mg
Calcium Chloride		130 mg
Charcoal		HOLD
Dextrose 10%		35 ml
Diazepam	(IV)	1.3 mg
	(Rectal)	3.2 mg
Dilaudid		HOLD
Diphenhydramine		5 mg
Dopamine (800 mg in 500 cc)		
2	mcg/kg/min	0.5 ml/hr
5	mcg/kg/min	1.3 ml/hr
10	mcg/kg/min	2.5 ml/hr
20	mcg/kg/min	5.0 ml/hr

Epinephrine 1:10,000	0.06 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Epinephrine 1:1000 IM	0.06 mg
Fentanyl	13.0 mcg
Glucagon	0.5 mg
Ibuprofen	N/A
Ipratropium	500 mcg
Levalbuterol	0.31 mg
Lidocaine	6 mg
Lorazepam	0.33 mg
Magnesium Sulfate	300 mg
Methylprednisolone	12.5 mg
Midazolam	0.5 mg
Morphine Sulfate	0.6 mg
Naloxone	0.6 mg
Ondansetron	1.0 mg
Prednisone	6.5 mg
Sodium Bicarbonate	6 mEq

Pink (3-6 Months)

Weight 8-9 Kg (Avg 8.5 Kg)

Length 66.5-74 cm

Vital Signs

Heart Rate	120
Respirations	24-32
BP Systolic	92 (+/-30)

Equipment

ET Tube	3.5-4.0
Blade Size	1

Defibrillation

Defibrillation	20 J, 40 J
Cardioversion	5 J, 9 J

Normal Saline 170 ml

Acetaminophen		128 mg
Adenosine	1st Dose-	0.9 mg
	Repeat Dose-	1.8 mg
Afrin Nasal Spray		HOLD
Albuterol		2.5 mg
Atropine		0.17 mg
Amiodarone		40 mg
Calcium Chloride		170 mg
Charcoal		HOLD
Dextrose 10%		43 ml
Diazepam	(IV)	1.7 mg
	(Rectal)	4.25 mg
Dilaudid		HOLD
Diphenhydramine		10 mg
Dopamine (800 mg in 500 cc)		
2	mcg/kg/min	0.7 ml/hr
5	mcg/kg/min	1.6 ml/hr
10	mcg/kg/min	3.2 ml/hr
20	mcg/kg/min	6.5 ml/hr

Epinephrine 1:10,000	0.08 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Epinephrine 1:1000 IM	0.08 mg
Fentanyl	17.0 mcg
Glucagon	0.5 mg
Ibuprofen	4.0 ml
Ipratropium	500 mcg
Levalbuterol	0.31 mg
Lidocaine	8 mg
Lorazepam	0.43 mg
Magnesium Sulfate	400 mg
Methylprednisolone	12.5 mg
Midazolam	0.85 mg
Morphine Sulfate	0.8 mg
Naloxone	0.8 mg
Ondansetron	1.2 mg
Prednisone	8.5 mg
Sodium Bicarbonate	8 mEq

Red (7-10 Months)

Pediatric Color Coded Drug List

Weight 10-11 Kg (Avg 10.5 Kg)

Length 74-84.5 cm

Vital Signs

Heart Rate	115-120
Respirations	22-30
BP Systolic	96 (+/-30)

Equipment

ET Tube	4.0
Blade Size	1

Defibrillation

Defibrillation	20 J, 40 J
Cardioversion	5 J, 10 J

Normal Saline 210 ml

Acetaminophen		160 mg
Adenosine	1st Dose-	0.9 mg
	Repeat Dose-	1.8 mg
Afrin Nasal Spray		HOLD
Albuterol		2.5 mg
Atropine		0.2 mg
Amiodarone		50 mg
Calcium Chloride		210 mg
Charcoal		HOLD
Dextrose 10%		50 ml
Diazepam	(IV)	1.0 mg
	(Rectal)	5.0 mg
Dilaudid		HOLD
Diphenhydramine		10 mg
Dopamine		
(800 mg in 500 ml Normal Saline)		
2	mcg/kg/min	0.8 ml/hr
5	mcg/kg/min	2.0 ml/hr
10	mcg/kg/min	4.0 ml/hr
20	mcg/kg/min	8.0 ml/hr

Epinephrine 1:10,000	0.1 mg
Epinephrine 1:1000 IM	0.1 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	21.0 mcg
Glucagon	1.0 mg
Ibuprofen	5.0 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	10 mg
Lorazepam	0.53 mg
Magnesium Sulfate	500 mg
Methylprednisolone	18.75 mg
Midazolam	1.0 mg
Morphine Sulfate	1.0 mg
Naloxone	1.0 mg
Ondansetron	1.6 mg
Prednisone	10.5 mg
Sodium Bicarbonate	10 mEq

Purple (11-18 Months)

Weight 12-14 Kg (Avg 13 Kg)

Length 84.5-97.5 cm

Vital Signs

Heart Rate	110-115
Respirations	20-28
BP Systolic	100(+/-30)

Equipment

ET Tube	4.5
Blade Size	2

Defibrillation

Defibrillation	30 J, 50 J
Cardioversion	6 J, 15 J

Normal Saline 260 ml

Acetaminophen		192 mg
Adenosine	1st Dose-	1.2 mg
	Repeat Dose-	2.4 mg
Afrin Nasal Spray		1 spray
Albuterol		2.5 mg
Atropine		0.26 mg
Amiodarone		65 mg
Calcium Chloride		260 mg
Charcoal		15 gms
Dextrose 10%		60-80 ml
Diazepam	(IV)	2.6 mg
	(Rectal)	6.5 mg
Dilaudid		HOLD
Diphenhydramine		10 mg
Dopamine		
(800 mg in 500 ml Normal Saline)		
2	mcg/kg/min	0.8 ml/hr
5	mcg/kg/min	2.5 ml/hr
10	mcg/kg/min	5.0 ml/hr
20	mcg/kg/min	10 ml/hr

Epinephrine 1:10,000	0.10 mg
Epinephrine 1:1000 IM	0.10 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	26.0 mcg
Glucagon	0.5 mg
Ibuprofen	6.5 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	14 mg
Lorazepam	0.65 mg
Magnesium Sulfate	650 mg
Methylprednisolone	25.0 mg
Midazolam	1 mg
Morphine Sulfate	1.0 mg
Naloxone	1.3 mg
Ondansetron	2.0 mg
Prednisone	13.0 mg
Sodium Bicarbonate	13 mEq

Yellow (19-35 Months)

Weight 15-18 Kg (Avg 16.5 Kg)

Length 97.5-110 cm

Vital Signs

Heart Rate	100-15
Respirations	20-26
BP Systolic	100(+/-20)

Equipment

ET Tube	5.0
Blade Size	2

Defibrillation

Defibrillation	30 J, 70 J
Cardioversion	8 J, 15 J

Normal Saline 330 ml

Acetaminophen		240 mg
Adenosine	1st Dose-	1.8 mg
	Repeat Dose-	3.6 mg
Afrin Nasal Spray		1 spray
Albuterol		2.5 mg
Atropine		0.32 mg
Amiodarone		80 mg
Calcium Chloride		330 mg
Charcoal		15-30 gms
Dextrose 10%		80 ml
Diazepam	(IV)	3.3 mg
	(Rectal)	8.25 mg
Dilaudid		HOLD
Diphenhydramine		15 mg
Dopamine		
(800 mg in 500 ml Normal Saline)		
2	mcg/kg/min	1.2 ml/hr
5	mcg/kg/min	3.0 ml/hr
10	mcg/kg/min	6.0 ml/hr
20	mcg/kg/min	12 ml/hr

Epinephrine 1:10,000	0.16 mg
Epinephrine 1:1000 IM	0.20 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	33.0 mcg
Glucagon	0.5 mg
Ibuprofen	8.0 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	15 mg
Lorazepam	0.83 mg
Magnesium Sulfate	800 mg
Methylprednisolone	31.25 mg
Midazolam	1.5 mg
Morphine Sulfate	1.0 mg
Naloxone	1.6 mg
Ondansetron	2.4 mg
Prednisone	16.5 mg
Sodium Bicarbonate	16 mEq

White (3-4 yrs)

Pediatric Color Coded Drug List

Weight 19-22 Kg (Avg 20.75 Kg)

Length 110-122 cm

Vital Signs

Heart Rate	100
Respirations	20-24
BP Systolic	100(+/-15)

Equipment

ET Tube	5.5
Blade Size	2

Defibrillation

Defibrillation	40 J, 85 J
Cardioversion	10 J, 20 J

Normal Saline 410 ml

Acetaminophen		288 mg
Adenosine	1st Dose-	2.1 mg
	Repeat Dose-	4.1 mg
Afrin Nasal Spray		1 spray
Albuterol		2.5 mg
Atropine		0.4 mg
Amiodarone		100 mg
Calcium Chloride		420 mg
Charcoal		20-40 gms
Dextrose 10%		100 ml
Diazepam	(IV)	4.0 mg
	(Rectal)	10.0 mg
Dilaudid		0.31 mg
Diphenhydramine		25.0 mg
Dopamine		
(800 mg in 500 ml Normal Saline)		
2	mcg/kg/min	1.6 ml/hr
5	mcg/kg/min	3.9 ml/hr
10	mcg/kg/min	7.8 ml/hr
20	mcg/kg/min	16 ml/hr

Epinephrine 1:10,000	0.2 mg
Epinephrine 1:1000 IM	0.2 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	40.0 mcg
Glucagon	1.0 mg
Ibuprofen	10.0 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	20 mg
Lorazepam	1.0 mg
Magnesium Sulfate	1000 mg
Methylprednisolone	37.5 mg
Midazolam	2.0 mg
Morphine Sulfate	2.0 mg
Naloxone	2.0 mg
Ondansetron	3.0 mg
Prednisone	20.0 mg
Sodium Bicarbonate	20 mEq

Blue (5-6 yrs)

Weight 24-30 Kg (Avg 27 Kg)

Length 122-137 cm

Vital Signs

Heart Rate	90
Respirations	18-22
BP Systolic	105(+/-15)

Equipment

ET Tube	6.0
Blade Size	2-3

Defibrillation

Defibrillation	50 J, 100 J
Cardioversion	15 J, 30 J

Normal Saline 540 ml

Acetaminophen		384 mg
Adenosine	1st Dose-	2.7 mg
	Repeat Dose-	5.4 mg
Afrin Nasal Spray		1 spray
Albuterol		2.5 mg
Atropine		0.5 mg
Amiodarone		135 mg
Calcium Chloride		540 mg
Charcoal		25-50 gms
Dextrose 10%		135 ml
Diazepam	(IV)	4.0 mg
	(Rectal)	10.0 mg
Dilaudid		0.4 mg
Diphenhydramine		25 mg
Dopamine		
(800 mg in 500 ml Normal Saline)		
2	mcg/kg/min	2 ml/hr
5	mcg/kg/min	5 ml/hr
10	mcg/kg/min	10 ml/hr
20	mcg/kg/min	20 ml/hr

Epinephrine 1:10,000	0.27 mg
Epinephrine 1:1000 IM	0.3 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	54.0 mcg
Glucagon	1.0 mg
Ibuprofen	13 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	20 mg
Lorazepam	1.35 mg
Magnesium Sulfate	1350 mg
Methylprednisolone	54.0 mg
Midazolam	2.0 mg
Morphine Sulfate	2.0 mg
Naloxone	2.0 mg
Ondansetron	4.0 mg
Prednisone	27.0 mg
Sodium Bicarbonate	27 mEq

Orange (7-9 yrs)

Weight 32-40 Kg (Avg 36 Kg)

Length 137-150 cm

Vital Signs

Heart Rate	85-90
Respirations	16-22
BP Systolic	115(+/-20)

Equipment

ET Tube	6.5
Blade Size	3

Defibrillation

Defibrillation	60 J, 150 J
Cardioversion	15 J, 30 J

Normal Saline 720 ml

Acetaminophen		544 mg
Adenosine	1st Dose-	3.6 mg
	Repeat Dose-	7.2 mg
Afrin Nasal Spray		2 spray
Albuterol		2.5 mg
Atropine		0.5 mg
Amiodarone		180 mg
Calcium Chloride		700 mg
Charcoal		25-50 gms
Dextrose 10%		180 ml
Diazepam	(IV)	4.0 mg
	(Rectal)	10.0 mg
Dilaudid		0.54 mg
Diphenhydramine		35 mg
Dopamine		
(800 mg in 500 ml Normal Saline)		
2	mcg/kg/min	2.7 ml/hr
5	mcg/kg/min	7.0 ml/hr
10	mcg/kg/min	14.0 ml/hr
20	mcg/kg/min	28.0 ml/hr

Epinephrine 1:10,000	0.3 mg
Epinephrine 1:1000 IM	0.3 mg
Epinephrine 1:1000 Nebulized	2.0 mg
Fentanyl	62.0 mcg
Glucagon	1.0 mg
Ibuprofen	18 ml
Ipratropium	500 mcg
Levalbuterol	0.63 mg
Lidocaine	36 mg
Lorazepam	1.8 mg
Magnesium Sulfate	1800 mg
Methylprednisolone	62.5 mg
Midazolam	2.0 mg
Morphine Sulfate	3.0 mg
Naloxone	2.0 mg
Ondansetron	4.0 mg
Prednisone	36.0 mg
Sodium Bicarbonate	36 mEq

Green (10-12 yrs)

ROWAN COUNTY

EMERGENCY SERVICES

EMS DIVISION

Be an original.

EMS System

Patient Care Policies

&

Procedures

Released July 2013

Revised December 2017

Standards Procedure (Skill)

12/15 Lead ECG

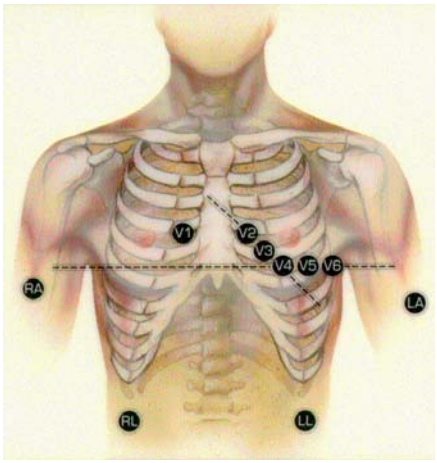
Clinical Indications:

- Suspected cardiac patient
- Suspected tricyclic overdose
- Electrical injuries
- Syncope

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Assess patient and monitor cardiac status with the 3 lead ECG.
2. Administer oxygen as patient condition warrants.
3. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG. A 12 lead ECG should be performed before the administration of nitroglycerin.
4. Prepare ECG monitor and connect patient cable with electrodes.
5. Enter the required patient information (patient name, etc.) into the 12 lead ECG device.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:
   - RA -Right arm
   - LA -Left arm
   - RL -Right leg
   - LL -Left leg
   - V1 -4th intercostal space at right sternal border
   - V2 -4th intercostal space at left sternal border
   - V3 -Directly between V2 and V4
   - V4 -5th intercostal space at midclavicular line
   - V5 -Level with V4 at left anterior axillary line
   - V6 -Level with V5 at left midaxillary line



8. Instruct patient to remain still.
9. Press the appropriate button to acquire the 12 Lead ECG.
10. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the lead acquisition will be interrupted until the noise is removed.
11. Once acquired, transmit the ECG data to the appropriate hospital if available.
12. Contact the receiving hospital to notify them that a 12 Lead ECG has been sent.
13. Monitor the patient while continuing with the treatment protocol.
14. The second 12 lead should be obtained by applying the V4 chest lead to the 5th intercostal space at the midclavicular line on the right side of the chest, the V5 chest lead to the V8 position at the midscapular line and the V6 chest lead to the V9 position at the left paraspinal line.
15. Instruct the patient to remain still.
16. Press the appropriate button to acquire the 12 Lead ECG.
17. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the lead acquisition will be interrupted until the noise is removed.
18. Label the printed 12 lead to identify V4 as V4R, V5 as V8 and V6 as V9 and notify the hospital if there is indication of posterior or right heart involvement.

19. Monitor the patient while continuing with the treatment protocol.
20. Download data as per guidelines and attach a copy of the 12/15 lead to the ACR.
21. Document the procedure, time, and results on/with the patient care report (PCR)

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

EMT and EMT-Intermediate personnel should maintain the knowledge and technical skills to acquire the ECG's as described. However, interpretation is still the role of the EMT-Paramedic.

Airway: BIAD-Combitube

Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Inability to adequately ventilate a patient with a Bag Valve Mask (BVM) or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Patient must be ≥ 5 feet and ≥16 years of age and must be unconscious.

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Preoxygenate and hyperventilate the patient.
2. Lubricate the tube.
3. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
4. Gently insert the tube until the teeth are between the printed rings.
5. Inflate line 1 (blue pilot balloon) leading to the pharyngeal cuff with 100 cc of air.
6. Inflate line 2 (white pilot balloon) leading to the distal cuff with 15 cc of air.
7. **Ventilate the patient through the longer blue tube**.
   - Auscultate for breath sounds and sounds over the epigastrium.
   - Look for the chest to rise and fall.
8. **If breath sounds are positive and epigastric sounds are negative, continue ventilation through the blue tube. The tube is in the esophagus.**
   - In the esophageal mode, stomach contents can be aspirated through the #2, white tube relieving gastric distention.
9. If breath sounds are negative and epigastric sounds are positive, attempt ventilation through the shorter, #2 white tube and reassess for lung and epigastric sounds. If breath sounds are present and the chest rises, you have intubated the trachea and continue ventilation through the shorter tube.
10. The device is secured by the large pharyngeal balloon.
11. **Confirm tube placement using end-tidal CO_2 detector or esophageal bulb device.**
12. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
13. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

- **Endotracheal intubation with a Combitube in Place (Only if ventilation unsuccessful):**
  - If you cannot ventilate with the Combitube in place, you should remove the tube, open and suction the airway, and ventilate with a BVM prior to intubation or re-establishment of another BIAD.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Airway: BIAD King

Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Patient must be unconscious.

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Preoxygenate and hyperventilate the patient.
2. Select the appropriate tube size for the patient.
3. Lubricate the tube.
4. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
5. Gently insert the tube rotated laterally 45-90 degrees so that the blue orientation line is touching the corner of the mouth. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
6. Inflate the pilot balloon with 45-90 ml of air depending on the size of the device used.
7. **Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated**.
8. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
9. The large pharyngeal balloon secures the device.
10. **Confirm tube placement using end-tidal CO_2 detector.**
11. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
12. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Airway: BIAD-Laryngeal Mask Airway (LMA)

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- **This airway does not prevent aspiration of stomach contents.**

Clinical Contraindications:

- Deforming Facial Trauma
- Pulmonary Fibrosis
- Morbid Obesity

Procedure:

1. Select the appropriate tube size for the patient.
2. Check the tube for proper inflation and deflation.
3. Completely deflate the tube prior to insertion.
4. Lubricate with a water-soluble jelly.
5. Pre-Oxygenate the patient with 100% Oxygen
6. Insert the LMA into the hypopharynx until resistance is met.
7. Inflate the cuff until a seal is obtained.
8. Connect the LMA to an ambu bag and assess for breath sounds and air entry.
9. **Confirm tube placement using end-tidal CO_2 detector or esophageal bulb device.**
10. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
11. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
12. Re-verify LMA placement after every move and upon arrival in the ED
13. Document the procedure, time, and result (success) on/with the patient care report (PCR)
14. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation once per certification cycle.

Airway: CPAP

I	EMT- I	I
P	EMT- P	P

Clinical Indications for Continuous Positive Airway Pressure (CPAP) Use:

- CPAP is indicated in all patients whom inadequate ventilation is suspected that is not associated with Asthma. This could be as a result of pulmonary edema, pneumonia, COPD, etc.

Clinical Contraindications for Continuous Positive Airway Pressure (CPAP) Use:

- Decreased Mental Status.
- Facial features or deformities that prevent an adequate mask seal.
- Excessive respiratory secretions.

Procedure:

1. Ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient.
3. Consider placement of a nasopharyngeal airway.
4. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point.
5. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.
6. If the Positive End Expiratory Pressure (PEEP) is adjustable on the CPAP device adjust the PEEP beginning at 0 cmH_20 of pressure and slowly titrate to achieve a positive pressure as follows:
   - 5 – 10 cmH_20 for Pulmonary Edema, Near Drowning, possible aspiration or pneumonia
   - 3 – 5 cm H_20 for COPD
7. Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
8. Titrate oxygen levels to the patient's response. Many patients respond to low FIO2 (30-50%).
9. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. The patient must be breathing for optimal use of the CPAP device.
10. Document time and response on patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Airway: Cricothyrotomy-Surgical

Clinical Indications:

P EMT- P P

- Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed or have failed in a patient ≥ 12 years old.

Procedure:

1. Have suction and supplies available and ready.
2. Locate the cricothyroid membrane utilizing anatomical landmarks.
3. Prep the area with an antiseptic swab (Betadine).
4. Attach a 5-cc syringe to an 18G - 1 & 1/2-inch needle.
5. Insert the needle (with syringe attached) perpendicularly through the cricothyroid membrane with the needle directed posteriorly.
6. During needle insertion, gentle aspiration should be applied to the syringe. Rapid aspiration of air into the syringe indicates successful entry into the trachea. Do not advance the needle any further. Attach forceps and remove syringe.
7. With the needle remaining in place, make a 1-inch vertical incision through the skin and subcutaneous tissue above and below the needle using a scalpel. Using blunt dissection technique, expose the cricothyroid membrane. This is a bloody procedure. The needle should act as a guide to the cricothyroid membrane.
8. With the needle still in place, make a horizontal stabbing incision approx. 1/2 inch through the membrane on each side of the needle. Remove the needle.
9. Using (skin hook, tracheal hook, or gloved finger) to maintain surgical opening, insert the cuffed tube into the trachea. (Cric tube from the kit or a #6 endotracheal tube is usually sufficient).
10. Inflate the cuff with 5-10cc of air and ventilate the patient while manually stabilizing the tube.
11. All of the standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise & fall, end-tidal CO_2 detector, etc.) Esophageal bulb devices are not accurate with this procedure.
12. Secure the tube.
13. If Available apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.
14. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement and after each movement of the patient.
15. Consider placing an NG or OG tube to clear stomach contents after the airway is secured.
16. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
17. **It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Airway: Needle Cric / Pediatric

Clinical Indications:

P EMT- P P

- Pediatric Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed or have failed in a patient < 11 years of age.

Procedure:

1. Have suction and supplies available and ready.
2. Locate the cricothyroid membrane utilizing anatomical landmarks.
3. Prep the area with an antiseptic swab (Betadine).
4. Use a 14G - 1 & 1/2-inch needle, or appropriate selected size for patient size.
5. Insert the needle perpendicularly through the cricothyroid membrane with the needle directed posteriorly.
6. Be careful during insertion as to not progress posteriorly but in a caudil direction.
7. Remove needle leaving the catheter in place.
8. Attach the BVM adapter from a 3.0 or 3.5 ET Tube to the catheter and provide oxygenation with oxygen attached to the BVM.
9. Monitor pulse ox – SPO2 should improve if circulation is adequate. ETCO2 will be of limited benefit since elimination of CO2 through a needle cric is difficult.
10. Secure the catheter in place.
11. Document needle/catheter size, time, result (success).
12. Document all devices used to confirm oxygenation and after each movement of the patient.
13. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Pulse Oximetry.**
14. **It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Airway: Endotracheal Tube Introducer (Bougie)

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Patients meet clinical indications for oral intubation
- Initial intubation attempt(s) unsuccessful
- Predicted difficult intubation

Contraindications:

- Three attempts at orotracheal intubation (utilize failed airway protocol)
- Age less than eight (8) or ETT size less than 6.5 mm

Procedure:

1. Prepare, position and oxygenate the patient with 100% oxygen;
2. Select proper ET tube without stylet, test cuff and prepare suction;
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal 1/2 of the Endotracheal Tube Introducer (Bougie) (note: Failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT);
4. Using laryngoscopic techniques, visualize the vocal cords if possible using Sellick's/BURP as needed;
5. Introduce the Bougie with curved tip anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized;
6. Once inserted, gently advance the Bougie until you meet resistance or "hold-up" (if you do not meet resistance you have a probable esophageal intubation and insertion should be re-attempted or the failed airway protocol implemented as indicated);
7. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie;
8. Gently advance the Bougie and loaded ET tube until you have hold-up again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie;
9. While maintaining a firm grasp on the proximal Bougie, introduce the ET tube over the Bougie passing the tube to its appropriate depth;
10. If you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER clockwise to turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT you may attempt direct laryngoscopy while advancing the ETT(this will require an assistant to maintain the position of the Bougie and, if so desired, advance the ETT);
11. Once the ETT is correctly placed, hold the ET tube securely and remove the Bougie;
12. Confirm tracheal placement according to the intubation protocol, inflate the cuff with 3 to 10 cc of air, auscultate for equal breath sounds and reposition accordingly;
13. When final position is determined secure the ET tube, reassess breath sounds, apply end tidal CO2 monitor, and record and monitor readings to assure continued tracheal intubation.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Airway: Foreign Body Obstruction

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Sudden onset of respiratory distress often with coughing, wheezing, gagging, or stridor due to a foreign-body obstruction of the upper airway.

Procedure:

1. Assess the degree of foreign body obstruction
   - Do not interfere with a mild obstruction allowing the patient to clear their airway by coughing.
   - In severe foreign-body obstructions, the patient may not be able to make a sound. The victim my clutch his/her neck in the universal choking sign.
2. **For an infant**, deliver 5 back blows (slaps) followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive.
3. **For a child**, perform a subdiaphragmatic abdominal thrust (Heimlich Maneuver) until the object is expelled or the victim becomes unresponsive.
4. **For adults**, a combination of maneuvers may be required.
   - First, subdiaphragmatic abdominal thrusts (Heimlich Maneuver) should be used in rapid sequence until the obstruction is relieved.
   - If abdominal thrusts are ineffective, chest thrusts should be used. Chest thrusts should be used primarily in morbidly obese patients and in the patients who are in the late stages of pregnancy
5. If the victim becomes unresponsive, begin CPR immediately but look in the mouth before administering any ventilations. If a foreign-body is visible, remove it.
6. **Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.**
7. In unresponsive patients, EMT-Intermediate and EMT-Paramedic level professionals should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magil forceps.
8. Document the methods used and result of these procedures in the patient care report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

North Carolina College of Emergency Physicians
Standards Procedure (Skill)
Airway Intubation Confirmation – End-Tidal CO_2 Detector

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- The End-Tidal CO_2 detector shall be used with any Endotracheal Tube or Blind Insertion Airway Device use.

It is strongly recommended that continuous Capnography be used in place of or in addition to the use of an End-Tidal CO_2 detector.

Procedure:

1. Attach End-Tidal CO_2 detector to the Blind Insertion Airway Device or the Endotracheal Tube.
2. Note color change. A color change or CO_2 detection will be documented on each respiratory failure or cardiac arrest patient.
3. The CO_2 detector shall remain in place with the airway and monitored throughout the prehospital care and transport unless continuous Capnography is used. Any loss of CO_2 detection or color change is to be documented and monitored as procedures are done to verify or correct the airway problem.
4. Tube placement should be verified frequently and always with each patient move or loss of color change in the End-Tidal CO_2 detector.
5. Document the procedure and the results on/with the Patient Care Report (PCR) as well as on the Airway Evaluation Form.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Airway: Intubation Confirmation-Esophageal Bulb

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- To assist in determining and documenting the correct placement of an Endotracheal or Nasotracheal tube.

It is strongly recommended that continuous Capnography be used in place of or in addition to the use of an Esophageal Bulb device.

Procedure:

1. Complete intubation as per Airway-Intubation Oral or Airway-Intubation Nasal procedures.
2. Place the bulb device over the proximal end of the ETT or NTT. Squeeze the bulb to remove all air prior to securing the bulb on the tube.
3. Once secured on the tube, release the bulb.
4. If the bulb expands evenly and easily, this indicates probable tracheal intubation. Assessment of the patient's breath sounds bilaterally should also be performed.
5. If the bulb does not expand easily, this indicates possible esophageal intubation and the need to reassess the airway.
6. Document time and result in the patient care report (PCR).
7. Do not repeat test since a false positive test can result from instillation of air into the esophagus.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

North Carolina College of Emergency Physicians
Standards Procedure (Skill)
Airway: Rapid Sequence Intubation

Clinical Indications:

P EMT- P P

- Need for advanced airway control in a patient who has a gag reflex
- or trismus (jaw clinching)
- Failure to protect the airway. Unable to ventilate and / or oxygenate. Impending airway compromise
- A minimum of 2 EMT-Paramedics on scene able to participate in patient care

Clinical Contraindications:

- Age ≤ 11 years of age.
- Refer to drug list for contraindications regarding use of Succinylcholine and Rocuronium.

Procedure:

1. Perform focused neurological exam
2. Evaluate for difficult airway (LEMON)-see appendix
3. Prepare equipment (intubation kit, BVM, suction, RSI medications, BIAD, Cricothyrotomy kit, waveform capnography, other airway adjuncts as available)
4. Pre-oxygenate patient with 100% oxygen via NRB mask or BVM. Apneic oxygenation: May continue high-flow oxygen via NC during entire procedure
5. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
6. Ensure functioning IV / IO access. Two (2) IV sites are preferable
7. Stroke / head trauma suspected? If yes, Lidocaine 1.5 mg/kg (per local medical director)
8. In-line c-spine stabilization by second caregiver (in setting of trauma)
9. Administer Etomidate (preferred agent) or Ketamine by rapid IV push
10. Administer Succinylcholine (preferred agent), await fasciculation and jaw relaxation or Rocuronium
11. Apply cricoid pressure (by third caregiver). This is optional and may improve or worsen view
12. Intubate trachea
13. Verify ET placement through auscultation, Capnography, and Pulse Oximetry
14. May repeat Succinylcholine or Rocuronium if inadequate relaxation
15. Release cricoid pressure (if utilized) and secure tube
16. **Continuous Capnography and Pulse Oximetry is required for RSI. Pre-intubation, minimal during intubation, and post-intubation readings must be recorded in the PCR.**
17. Re-verify tube placement after every move and upon arrival in the ED
18. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices/methods used to confirm initial tube placement initially and with patient movement.
19. Consider placing a gastric tube to clear stomach contents after the airway is secured.
20. **Completion of the Airway Evaluation Form is required including a signature from the receiving physician at the Emergency Department confirming proper tube placement.**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Airway: Intubation Nasotracheal

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- A spontaneously breathing patient in need of intubation (inadequate respiratory effort, evidence of hypoxia or carbon dioxide retention, or need for airway protection).
- Rigidity or clenched teeth prohibiting other airway procedures.
- Patient must be 12 years of age or older.

Procedure:

1. Premedicate the patient with nasal spray.
2. Select the largest and least obstructed nostril and insert a lubricated nasal airway to help dilate the nasal passage.
3. Preoxygenate the patient. Lubricate the tube. The use of a BAAM device is recommended.
4. Remove the nasal airway and gently insert the tube keeping the bevel of the tube toward the septum.
5. Continue to pass the tube listening for air movement and looking for to and fro vapor condensation in the tube. As the tube approaches the larynx, the air movement gets louder.
6. Gently and evenly advance the tube through the glottic opening on the inspiration. This facilitates passage of the tube and reduces the incidence of trauma to the vocal cords.
7. Upon entering the trachea, the tube may cause the patient to cough, buck, strain, or gag. Do not remove the tube! This is normal, but be prepared to control the cervical spine and the patient, and be alert for vomiting.
8. Auscultate for bilaterally equal breath sounds and absence of sounds of the epigastrium. Observe for symmetrical chest expansion. The 15mm adapter usually rests close to the nostril with proper positioning.
9. Inflate the cuff with 5-10 cc of air.
10. **Confirm tube placement using an end-tidal CO_2 monitoring or esophageal bulb device.**
11. Secure the tube.
12. Reassess airway and breath sounds after transfer to the stretcher and during transport. These tubes are easily dislodged and require close monitoring and frequent reassessment.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).
14. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
15. **It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Airway: Intubation Oral Tracheal

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.
- A component of Drug Assisted Intubation

Procedure:

1. Prepare, position and oxygenate the patient with 100% Oxygen.
2. Select proper ET tube (and stylette, if used), have suction ready.
3. Using laryngoscope, visualize vocal cords. (Use Sellick maneuver/BURP to assist you).
4. Limit each intubation attempt to 30 seconds with BVM between attempts.
5. Visualize tube passing through vocal cords.
6. **Confirm and document tube placement using an end-tidal CO_2 monitoring or esophageal bulb device.**
7. Inflate the cuff with 3-to10 cc of air; secure the tube to the patient's face.
8. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium. If you are unsure of placement, remove tube and ventilate patient with bag-valve mask.
9. Consider using a Blind Insertion Airway Device if intubation efforts are unsuccessful.
10. If Available apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.
11. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.
12. Consider placing an NG or OG tube to clear stomach contents after the airway is secured with an ET tube.
13. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
14. **It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Airway – Nebulizer Inhalation Therapy

Clinical Indications:

B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Patients experiencing bronchospasm.

Procedure:

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed drug (such as Albuterol or other approved drug) into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 4 - 6 liters per minute or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all of the solution.
7. Monitor the patient for medication effects. This should include the patient's assessment of his/her response to the treatment and reassessment of vital signs, ECG, and breath sounds.
8. Assess and document peak flows before and after nebulizer treatments.
9. Document the treatment, dose, and route on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Airway: Respirator Operation

Clinical Indications:

I	EMT- I	I
P	EMT- P	P

- Transport of an intubated patient

Procedure:

1. Confirm the placement of tube as per airway protocol.
2. Ensure adequate oxygen delivery to the respirator device.
3. Preoxygenate the patient as much as possible with bag-valve mask.
4. Remove BVM and attach tube to respiration device.
5. Per instructions of device, set initial respiration values. For example, set an inspiratory:expiratory ratio of 1:4 (for every 1 second of inspiration, allow 4 seconds and expiration) with a rate of 12 to 20.
6. Assess breath sounds. Allow for adequate expiratory time. Adjust respirator setting as clinically indicated.
7. **It is required that patients on a transport ventilator should be monitored continuously through Capnography and Pulse Oximetry. The ventilatory rate should adjusted to maintain a pulse oximetry of >90 (or as high as possible) while maintaining a pCO2 of 30-35.**
8. If any worsening of patient condition, decrease in oxygen saturation, or any question regarding the function of the respirator, remove the respirator and resume bag-valve mask ventilations.
9. Document time, complications, and patient response on the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Airway: Suctioning-Advanced

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assisted by an airway adjunct such as a naso-tracheal tube, endotracheal tube, Combitube, tracheostomy tube, or a cricothyrotomy tube.

Procedure:

1. Ensure suction device is in proper working order.
2. Preoxygenate the patient as is possible.
3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
4. Using the suprasternal notch and the end of the airway into the catheter will be placed as guides, measure the depth desired for the catheter (judgment must be used regarding the depth of suctioning with cricothyrotomy and tracheostomy tubes).
5. If applicable, remove ventilation devices from the airway.
6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
7. Once the desired depth (measured in #4 above) has been reached, occlude the thumb port and remove the suction catheter slowly.
8. A small amount of Normal Saline (10 ml) may be used if needed to loosen secretions for suctioning.
9. Reattach ventilation device (e.g., bag-valve mask) and ventilate the patient
10. Document time and result in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Airway: Suctioning-Basic

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient who cannot maintain or keep the airway clear.

Procedure:

1. Ensure suction device is in proper working order with suction tip in place.
2. Preoxygenate the patient as is possible.
3. Explain the procedure to the patient if they are coherent.
4. Examine the oropharynx and remove any potential foreign bodies or material which may occlude the airway if dislodged by the suction device.
5. If applicable, remove ventilation devices from the airway.
6. Use the suction device to remove any secretions, blood, or other substance.
7. The alert patient may assist with this procedure.
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient
9. Record the time and result of the suctioning in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Airway: Tracheostomy Tube Change

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Presence of Tracheostomy site.
- Urgent or emergent indication to change the tube, such as obstruction that will not clear with suction, dislodgement, or inability to oxygenate/ventilate the patient without other obvious explanation.

Procedure:

1. Have all airway equipment prepared for standard airway management, including equipment of orotracheal intubation and failed airway.
2. Have airway device (endotracheal tube or tracheostomy tube) of the same size as the tracheostomy tube currently in place as well as 0.5 size smaller available (e.g., if the patient has a #6.0 Shilley, then have a 6.0 and a 5.5 tube).
3. Lubricate the replacement tube(s) and check the cuff.
4. Remove the tracheostomy tube from mechanical ventilation devices and use a bag-valve apparatus to pre-oxygenate the patient as much as possible.
5. Once all equipment is in place, remove devices securing the tracheostomy tube, including sutures and/or supporting bandages.
6. If applicable, deflate the cuff on the tube. If unable to aspirate air with a syringe, cut the balloon off to allow the cuff to lose pressure.
7. Remove the tracheostomy tube.
8. Insert the replacement tube. Confirm placement via standard measures except for esophageal detection (which is ineffective for surgical airways).
9. If there is any difficultly placing the tube, re-attempt procedure with the smaller tube.
10. If difficulty is still encountered, use standard airway procedures such as oral bag-valve mask or endotracheal intubation (as per protocol). **More difficulty with tube changing can be anticipated for tracheostomy sites that are immature – i.e., less than two weeks old. Great caution should be exercised in attempts to change immature tracheotomy sites.**
11. Document procedure, confirmation, patient response, and any complications in the PCR

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment for this skill should include direct observation at least once per certification cycle.

Airway: Ventilator Operation

Clinical Indications:

P EMT- P P

- Management of the ventilation of a patient during a prolonged or interfacility transport of an intubated patient.

Procedure:

1. Transporting personnel should review the operation of the ventilator with the treating personnel (physician, nurse, or respiratory therapy) in the referring facility prior to transport if possible.
2. All ventilator settings, including respiratory rate, FiO_2, mode of ventilation, and tidal volumes should be recorded prior to initiating transport. Additionally, the recent trends in oxygen saturation experienced by the patient should be noted.
3. Prior to transport, specific orders regarding any anticipated changes to ventilator settings as well as causes for significant alarm should be reviewed with the referring medical personnel as well as medical control.
4. Once in the transporting unit, confirm adequate oxygen delivery to the ventilator.
5. Frequently assess breath sounds to assess for possible tube dislodgment during transfer.
6. Frequently assess the patient's respiratory status, noting any decreases in oxygen saturation or changes in tidal volumes, peak pressures, etc.
7. Note any changes in ventilator settings or patient condition in the PCR.
8. Consider placing an NG or OG tube to clear stomach contents.
9. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
10. If any significant change in patient condition, including vital signs or oxygen saturation or there is a concern regarding ventilator performance/alarms, remove the ventilator from the endotracheal tube and use a bag-valve mask with 100% O_2. Contact medical control immediately.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Arterial Access: Blood Draw

Clinical Indications:

P EMT- P P

- Arterial blood gas (ABG) analysis
- Other needs for arterial blood as indicated by medical control

Procedure:

1. Assemble ABG kit, ice, alcohol wipes, and gloves.
2. Determine if there is any history of trauma or any other difficulties with circulation to either hand. If a problem does exist, do not use that extremity for the blood draw.
3. Palpate the radial pulse just proximal to the wrist.
4. Clean the skin with an alcohol wipe.
5. Insert the ABG syringe at a 45 to 60 degree angle over the area of the pulse.
6. Slowly advance the syringe, watching for return of arterial blood. You do not need to aspirate but rather allow the syringe to fill from the arterial pressure.
7. Once the sample has been acquired, remove and discard the needle in an approved fashion.
8. Place the small airtight cap over the needle port on the syringe. Remove air from the sample by inverting the syringe and pressing the plunger on the syringe until a small amount of the sample enters the airtight cap.
9. Place the sample on ice as soon as possible
10. Hold pressure over the blood draw sight for at least 5 minutes before checking to ensure hemostasis.
11. Record procedure, time, and any complications in patient care report (PCR)

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Arterial Access: Line Maintenance

Clinical Indications:

P EMT- P P

- Transport of a patient with an existing arterial line.

Procedure:

1. Make certain arterial line is secured prior to transport, including intersection of arterial catheter and IV/Monitoring lines.
2. Use available equipment for monitoring of arterial pressures via arterial line.
3. Do not use the arterial line for administration of any fluids or medications.
4. If there is any question regarding dislodgement of the arterial line and bleeding results, remove the line and apply direct pressure over the site for at least five minutes before checking to ensure hemostasis.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Assessment: Adult

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Any patient requesting a medical evaluation that is too large to be measured with a Broselow-Luten Resuscitation Tape.

Procedure:

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
2. Assess need for additional resources.
3. Initial assessment includes a general impression as well as the status of a patient's airway, breathing, and circulation.
4. Assess mental status (e.g., AVPU) and disability (e.g., GCS).
5. Control major hemorrhage and assess overall priority of patient.
6. Perform a focused history and physical based on patient's chief complaint.
7. Assess need for critical interventions.
8. Complete critical interventions and perform a complete secondary exam to include a baseline set of vital signs as directed by protocol.
9. Maintain an on-going assessment throughout transport; to include patient response/possible complications of interventions, need for additional interventions, and assessment of evolving patient complaints/conditions.
10. Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the PCR.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

North Carolina College of Emergency Physicians
Standards Procedure (Skill)
Pain Assessment and Documentation

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

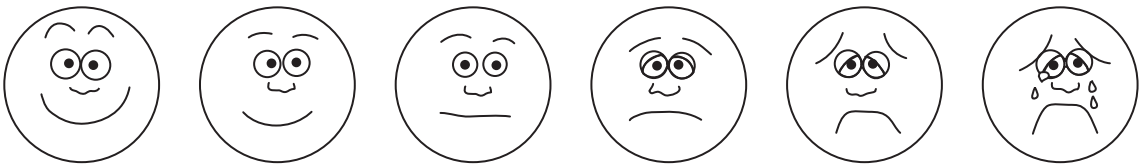
- Any patient with pain.

Definitions:

- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).

Procedure:

1. Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report.
2. Pain should be assessed and documented in the PCR during initial assessment, before starting pain control treatment, and with each set of vitals.
3. Pain should be assessed using the appropriate approved scale.
4. Three pain scales are available: the 0 – 10, the Wong - Baker "faces", and the FLACC.
   - 0 – 10 Scale: the most familiar scale used by EMS for rating pain with patients. It is primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.
   - Wong – Baker "FACES" scale: this scale is primarily for use with pediatrics but may also be used with geriatrics or any patient with a language barrier. The faces correspond to numeric values from 0-10. This scale can be documented with the numeric value.



0	2	4	6	8	10
No hurt	Hurts little bit	Hurts little more	Hurts even more	Hurts whole lot	Hurts worst

From Hockenberry MJ, Wilson D, Winkelstein ML: Wong's Essentials of Pediatric Nursing, ed. 7, St. Louis, 2005, p. 1259. Used with permission. Copyright, Mosby.

   - FLACC scale: this scale has been validated for measuring pain in children with mild to severe cognitive impairment and in pre-verbal children (including infants).

CATEGORIES	SCORING		
	0	1	2
FACE	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested.	Frequent to constant quivering chin, clenched jaw.
LEGS	Normal position or relaxed.	Uneasy, restless, tense.	Kicking, or legs drawn up.
ACTIVITY	Lying quietly, normal position moves easily.	Squirming, shifting back and forth, tense.	Arched, rigid or jerking.
CRY	No cry, (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints.
CONSOLABILITY	Content, relaxed.	Reassured by occasional touching hugging or being talked to, distractable.	Difficulty to console or comfort

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Assessment: Pediatric

Clinical Indications:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Any child that can be measured with the Broselow-Luten Resuscitation Tape.

Procedure:

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
2. Assess patient using the pediatric triangle of ABCs:
   - Airway and appearance: speech/cry, muscle tone, inter-activeness, look/gaze, movement of extremities
   - Work of breathing: absent or abnormal airway sounds, use of accessory muscles, nasal flaring, body positioning
   - Circulation to skin: pallor, mottling, cyanosis
3. Establish spinal immobilization if suspicion of spinal injury
4. Establish responsiveness appropriate for age (AVPU, GCS, etc.)
5. Color code using Broselow-Luten tape
6. Assess disability (pulse, motor function, sensory function, papillary reaction)
7. Perform a focused history and physical exam. Recall that pediatric patients easily experience hypothermia and thus should not be left uncovered any longer than necessary to perform an exam.
8. Record vital signs (BP > 3 years of age, cap refill < 3 years of age)
9. Include Immunizations, Allergies, Medications, Past Medical History, last meal, and events leading up to injury or illness where appropriate.
10. Treat chief complaint as per protocol

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Blood Glucose Analysis

Clinical Indications:

- Patients with suspected hypoglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.)

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Procedure:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained through a finger-stick or when possible simultaneously with intravenous access.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
7. Perform Quality Assurance on glucometers at least once every 7 days, if any clinically suspicious readings are noted, and/or as recommended by the manufacturer and document in the log.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Capnography

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Capnography shall be used when available with the use of all invasive airway procedures including endotracheal, nasotracheal, cricothyrotomy, or Blind Insertion Airway Devices (BIAD).
- Capnography should also be used when possible with CPAP.

Procedure:

1. Attach capnography sensor to the BIAD, endotracheal tube, or oxygen delivery device.
2. Note CO_2 level and waveform changes. These will be documented on each respiratory failure, cardiac arrest, or respiratory distress patient.
3. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
4. Any loss of CO_2 detection or waveform indicates an airway problem and should be documented.
5. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
6. Document the procedure and results on/with the Patient Care Report (PCR) and the Airway Evaluation Form.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Cardiac: External Pacing

P EMT- P P

Clinical Indications:

- Patients with symptomatic bradycardia (less than 60 per minute) with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
  - Chest Pain
  - Hypotension
  - Pulmonary Edema
  - Altered Mental Status, Confusion, etc.
  - Ventricular Ectopy
- Asystole, pacing must be done early to be effective.
- PEA, where the underlying rhythm is bradycardic and reversible causes have been treated.

Procedure:

1. Attach standard four-lead monitor.
2. Apply defibrillation/pacing pads to chest and back:
   - One pad to left mid chest next to sternum
   - One pad to mid left posterior chest next to spine.
3. Rotate selector switch to pacing option.
4. Adjust heart rate to 70 BPM for an adult and 100 BPM for a child.
5. Note pacer spikes on EKG screen.
6. Slowly increase output until capture of electrical rhythm on the monitor.
7. If unable to capture while at maximum current output, stop pacing immediately.
8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
9. Consider the use of sedation or analgesia if patient is uncomfortable.
10. Document the dysrhythmia and the response to external pacing with ECG strips in the PCR.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Cardiopulmonary Resuscitation (CPR)

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Basic life support for the patient in cardiac arrest

Procedure:

1. Assess the patient's level of responsiveness (shake and shout)
2. If no response, open the patient's airway with the head-tilt, chin-lift and look, listen, and feel for respiratory effort. If the patient may have sustained C-spine trauma, use the modified jaw thrust while maintaining immobilization of the C-spine. For infants, positioning the head in the sniffing position is the most effective method for opening the airway.
3. Check for pulse (carotid for adults and older children, brachial for infants) for at least 10 seconds. If no pulse, begin chest compressions based on chart below:

Age	Location	Depth	Rate
Infant	Over sternum, between nipples (inter-mammary line), 2-3 fingers	1.5 inches	At least 100/minute
Child	Over sternum, just cephalad from xyphoid process, heel of one hand	2 inches	At least 100/minute (3 compressions Every 2 seconds)
Adult	Over sternum, just cephalad from xyphoid process, hands with interlocked fingers	At least 2 inches	At least 100/minute (3 compressions Every 2 seconds)

4. If patient is an adult, go to step 5. If no respiratory effort in a pediatric patient, give two ventilations. If air moves successfully, go to step 5. If air movement fails, proceed to the Airway Obstruction Procedure.
5. Go to Cardiac Arrest Procedure. Begin ventilations in the adult as directed in the Cardiac Arrest Procedure
6. Provide 8 - 10 breaths per minute with the BVM. Use EtCO2 to guide your ventilations as directed in the Cardiac Arrest Protocol.
7. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions (< 5 seconds with a maximum of 10 seconds) are allowed for rhythm analysis, defibrillation, and performance of procedures
8. Document the time and procedure in the Patient Care Report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Cardioversion

P EMT- P P

Clinical Indications:

- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

Procedure:

1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion.
2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.
3. Consider the use of pain or sedating medications.
4. Set energy selection to the appropriate setting.
5. Set monitor/defibrillator to synchronized cardioversion mode.
6. Make certain all personnel are clear of patient.
7. Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to “synchronize”, so there may a delay between activating the cardioversion and the actual delivery of energy.
8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient’s rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation, following the procedure for Defibrillation-Manual.
9. If the patient’s condition is unchanged, repeat steps 2 to 8 above, using escalating energy settings.
10. Repeat until maximum setting or until efforts succeed. Consider discussion with medical control if cardioversion is unsucessful after 2 attempts.
11. Note procedure, response, and time in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle., or other mechanisms as deemed appropriate by the local EMS System.

Chest Decompression

Clinical Indications:

P EMT- P P

- Patients with hypotension (SBP <90), clinical signs of shock, and at least one of the following signs:
  - Jugular vein distention.
  - Tracheal deviation away from the side of the injury (often a late sign).
  - Absent or decreased breath sounds on the affected side.
  - Hyper-resonance to percussion on the affected side.
  - Increased resistance when ventilating a patient.

- Patients in traumatic arrest with chest or abdominal trauma for whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site:
   - Locate the second intercostals space in the mid-clavicular line on the same side as the pneumothorax.
   - If unable to place anteriorly, lateral placement may be used at the fourth ICS mid-axillary line.
   - Prepare the site with providone-iodine ointment or solution.
4. Insert the catheter (14 gauge for adults) into the skin over the third rib and direct it just over the top of the rib (superior border) into the interspace.
5. Advance the catheter through the parietal pleura until a “pop” is felt and air or blood exits under pressure through the catheter, then advance catheter only to chest wall.
6. Remove the needle, leaving the plastic catheter in place.
7. Secure the catheter hub to the chest wall with dressings and tape.
8. Consider placing a finger cut from an exam glove over the catheter hub. Cut a small hole in the end of the finger to make a flutter valve. Secure the glove finger with tape or a rubber band. (Note – don’t waste much time preparing the flutter valve; if necessary control the air flow through the catheter hub with your gloved thumb.)

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation once per certification cycle.

Childbirth

Clinical Indications:

B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Imminent delivery with crowning

Procedure:

1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Suction the airway with a bulb syringe.
5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
6. Gently pull up on the head to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the **Newly Born Protocol** for further treatment.
11. The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue rapid transport to the hospital.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

CNS Catheter: Epidural Catheter Maintenance

Clinical Indications:

P EMT- P P

- Presence of an epidural catheter in a patient requiring transport

Procedure:

1. Prior to transport, ensure catheter is secure and that transport personnel are familiar with medication(s) being delivered and devices used to control medication administration.
2. No adjustments in catheter position are to be attempted.
3. No adjustments in medication dosage or administration are to be attempted without direct approval from on-line medical control.
4. Report any complications immediately to on-line medical control.
5. Document the time and dose of any medication administration or rate adjustment in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

CNS Catheter: Ventricular Catheter Maintenance

Clinical Indications:

P | EMT- P | P

- Transport of a patient with an intra-ventricular catheter in place

Procedure:

1. Prior to transport, ensure the catheter is secure.
2. Prior to transport, determine from the referring hospital/physician the desired patient position (e.g., supine, head of bed elevated 30 degrees, etc.).
3. Prior to transport, determine the height at which the drain is to be maintained, given the patient position desired from #2 above (if applicable).
4. Do not manipulate or move the drain.
5. If the patient or height of the drain is altered, immediately correct based on the pre-determined configuration in step 2 and 3 above.
6. Report any problems immediately to on-line medical control.
7. Document the time and any adjustments or problems in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Decontamination

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons.

Procedure:

1. In coordination with HazMAT and other Emergency Management personnel, establish hot, warm and cold zones of operation.
2. Ensure that personnel assigned to operate within each zone have proper personal protective equipment.
3. In coordination with other public safety personnel, assure each patient from the hot zone undergoes appropriate initial decontamination. This is specific to each incident; such decontamination may include:
    - Removal of patients from Hot Zone
    - Simple removal of clothing
    - Irrigation of eyes
    - Passage through high-volume water bath (e.g., between two fire apparatus) for patients contaminated with liquids or certain solids. Patients exposed to gases, vapors, and powders often will not require this step as it may unnecessarily delay treatment and/or increase dermal absorption of the agent(s).
4. Initial triage of patients should occur after step #3. Immediate life threats should be addressed prior to technical decontamination.
5. Assist patients with technical decontamination (unless contraindicated based on #3 above). This may include removal of all clothing and gentle cleansing with soap and water. All body areas should be thoroughly cleansed, although overly harsh scrubbing which could break the skin should be avoided.
6. Place triage identification on each patient. Match triage information with each patient's personal belongings which were removed during technical decontamination. Preserve these personnel affects for law enforcement.
7. Monitor all patients for environmental illness.
8. Transport patients per local protocol.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Defibrillation: Automated

Clinical Indications:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Patients in cardiac arrest (pulseless, non-breathing).
- Age < 8 years, use Pediatric Pads if available.

Contraindication:

- Pediatric patients who are so small that the pads cannot be placed without touching one another.

Procedure:

1. **If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.**
2. Apply defibrillator pads per manufacturer recommendations. Based on 2010 guidelines, place pads preferably in AP or AL position when implanted devices (pacemakers, AICDs) occupy preferred pad positions and attempt to avoid placing directly over device.
3. Remove any medication patches on the chest and wipe off any residue.
4. If necessary, connect defibrillator leads: white to the anterior chest pad and the red to the posterior pad.
5. Activate AED for analysis of rhythm.
6. **Stop CPR and clear the patient** for rhythm analysis. Keep interruption in CPR as brief as possible.
7. Defibrillate if appropriate by depressing the "shock" button. **Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.** The sequence of defibrillation charges is preprogrammed for monophasic defibrillators. Biphasic defibrillators will determine the correct joules accordingly.
8. Begin CPR (chest compressions and ventilations) immediately after the delivery of the defibrillation.
9. After 2 minutes of CPR, analyze rhythm and defibrillate if indicated. Repeat this step every 2 minutes.
10. If "no shock advised" appears, perform CPR for two minutes and then reanalyze.
11. Transport and continue treatment as indicated.
12. **Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.**
13. **If pulse returns please use the Post Resuscitation Protocol**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Defibrillation: Manual

P EMT- P P

Clinical Indications:

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

Procedure:

1. **Ensure that Chest Compressions are adequate and interrupted only when absolutely necessary.**
2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
3. After application of an appropriate conductive agent if needed, apply defibrillation hands free pads (recommended to allow more continuous CPR) or paddles to the patient's chest in the proper position
   - Paddles: right of sternum at 2nd ICS and anterior axillary line at 5th ICS
   - Pads: anterior-posterior position

   For patients with implanted pacers/defibrillators, paddles or pads can be in AP or AL positions. The presence of implanted pacers/defibrillators should not delay defibrillation. Attempt to avoid placing paddles or pads directly above device.
4. Set the appropriate energy level
5. Charge the defibrillator to the selected energy level. **Continue chest compressions while the defibrillator is charging.**
6. If using paddles, assure proper contact by applying 25 pounds of pressure on each paddle.
7. **Hold Compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.**
8. Deliver the countershock by depressing the discharge button(s) when using paddles, or depress the **shock button** for hands free operation.
9. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.
10. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.
11. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Gastric Tube Insertion

Clinical Indications:

P EMT- P P

- Gastric decompression in intubated patients or for administration of activated charcoal in patients with altered mental status.

Procedure:

1. Estimate insertion length by superimposing the tube over the body from the nose to the stomach.
2. Flex the neck **if not contraindicated** to facilitate esophageal passage.
3. Liberally lubricate the distal end of the tube and pass through the patient's nostril along the floor of the nasal passage. Do not orient the tip upward into the turbinates. This increases the difficulty of the insertion and may cause bleeding.
4. In the setting of an intubated patient or a patient with facial trauma, oral insertion of the tube may be considered or preferred after securing airway.
5. Continue to advance the tube gently until the appropriate distance is reached.
6. Confirm placement by injecting 20cc of air and auscultate for the swish or bubbling of the air over the stomach. Additionally, aspirate gastric contents to confirm proper placement.
7. Secure the tube.
8. Decompress the stomach of air and food either by connecting the tube to suction or manually aspirating with the large catheter tip syringe.
9. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Injections: Subcutaneous and Intramuscular

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- When medication administration is necessary and the medication must be given via the SQ (not auto-injector) or IM route or as an alternative route in selected medications.

Procedure:

1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication expelling air from the syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. The most common site for subcutaneous injection is the arm.
    - Injection volume should not exceed 1 cc.
5. The possible injection sites for intramuscular injections include the arm, buttock and thigh.
    - Injection volume should not exceed 1 cc for the arm
    - Injection volume should not exceed 2 cc in the thigh or buttock.
6. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
7. Expose the selected area and cleanse the injection site with alcohol.
8. Insert the needle into the skin with a smooth, steady motion

SQ: 45-degree angle skin pinched **IM: 90-degree angle skin flattened**

9. Aspirate for blood
10. Inject the medication.
11. Withdraw the needle quickly and dispose of properly without recapping.
12. Apply pressure to the site.
13. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
14. Document the medication, dose, route, and time on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Orthostatic Blood Pressure Measurement

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Patient situations with suspected blood, fluid loss, or dehydration with no indication for spinal immobilization. Orthostatic vital signs are not routinely recommended.
- Patients ≥ 8 years of age, or patients larger than the Broselow-Luten tape
- Orthostatic Vital Signs are not sensitive nor specific for volume loss / dehydration and may induce syncope in some cases. Assessment of orthostatic vital signs are not routinely recommended. Local Medical Director should indicate and educate on situations where they may be helpful.

Procedure:

1. Gather and prepare standard sphygmomanometer and stethoscope.
2. With the patient supine, obtain pulse and blood pressure.
3. Have the patient sit upright.
4. After 30 seconds, obtain blood pressure and pulse.
5. If the systolic blood pressure falls more than 30 mmHg or the pulse rises more than 20 bpm, the patient is considered to be orthostatic.
6. If a patient experiences dizziness upon sitting or is obviously dehydrated based on history or physical exam, formal orthostatic examination should be omitted and fluid resuscitation initiated.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Pulse Oximetry

Clinical Indications:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Patients with suspected hypoxemia.

Procedure:

1. Apply probe to patient's finger or any other digit as recommended by the device manufacturer.
2. Allow machine to register saturation level.
3. Record time and initial saturation percent on room air if possible on/with the patient care report (PCR).
4. Verify pulse rate on machine with actual pulse of the patient.
5. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary.
6. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia.
7. In general, normal saturation is 97-99%. Below 94%, suspect a respiratory compromise.
8. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device.
9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain. Supplemental oxygen is not required if the oxyhemoglobin saturation is >= 94%, unless there are obvious signs of heart failure, dyspneic, or hypoxic to maintain to 94%.
10. Factors which may reduce the reliability of the pulse oximetry reading include but are not limited to:
    - Poor peripheral circulation (blood volume, hypotension, hypothermia)
    - Excessive pulse oximeter sensor motion
    - Fingernail polish (may be removed with acetone pad)
    - Carbon monoxide bound to hemoglobin
    - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
    - Jaundice
    - Placement of BP cuff on same extremity as pulse ox probe.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

North Carolina College of Emergency Physicians
Standards Procedure (Skill)

Reperfusion Checklist

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

Rapid evaluation of a patient with suspected acute stroke and/or acute myocardial infarction (STEMI) to:

- Determine eligibility and potential benefit from fibrinolysis..
- Rapid identification of patients who are not eligible for fibrinolysis and will require interventional therapy.

Procedure:

1. Follow the appropriate protocol for the patient's complaint to assess and identify an acute condition which could potentially benefit from fibrinolysis. If a positive finding is noted on one of the following assessments, proceed to step 2.
   - Perform a 12-lead ECG to identify an acute ST elevation myocardial infarction (STEMI).
   - Perform the Los Angles Pre-hospital Stroke Screen to identify an acute stroke
2. Complete the Reperfusion Check Sheet to identify any potential contraindications to fibrinolysis. (See Appendix)
   - Systolic Blood Pressure greater than 180 mm Hg
   - Diastolic Blood Pressure greater than 110 mm Hg
   - Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
   - History of structural Central Nervous System disease (age >= 18, history of aneurysm or AV-malformation, tumors, masses, hemorrhage, etc.)
   - Significant closed head or facial trauma within the previous 3 months
   - Recent (within 6 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal bleeding, or severe genital-urinary bleeding
   - Bleeding or clotting problem or on blood thinners
   - CPR performed greater than 10 minutes
   - Currently Pregnant
   - Serious Systemic Disease such as advanced/terminal cancer or severe liver or kidney failure.
3. Identify if the patient is currently in heart failure or cardiogenic shock. For these patients, a percutaneous coronary intervention is more effective.
   - Presence of pulmonary edema (rales greater than halfway up lung fields)
   - Systemic hypoperfusion (cool and clammy)
4. If any contraindication is noted using the check list and an acute Stroke is suspected by exam or a STEMI is confirmed by ECG, activate the EMS Stroke Plan or EMS STEMI Plan for fibrinolytic ineligable patients. This may require the EMS Agency, an Air Medical Service, or a Specialty Care Transport Service to transport directly to an specialty center capable of interventional care within the therapeutic window of time.
5. Record all findings in the Patient Care Report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Restraints: Physical

B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Any patient who may harm himself, herself, or others may be gently restrained to prevent injury to the patient or crew. This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or other less restrictive therapeutic means. Physical or chemical restraint should be a last resort technique.

Procedure:

1. Attempt less restrictive means of managing the patient.
2. Request law enforcement assistance and **Contact Medical Control**.
3. Ensure that there are sufficient personnel available to physically restrain the patient safely.
4. Restrain the patient in a lateral or supine position. No devices such as backboards, splints, or other devices will be on top of the patient. The patient will never be restrained in the prone position.
5. The patient must be under constant observation by the EMS crew at all times. This includes direct visualization of the patient as well as cardiac and pulse oximetry monitoring.
6. The extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This MUST be documented on the PCR.
7. Documentation on/with the patient care report (PCR) should include the reason for the use of restraints, the type of restraints used, and the time restraints were placed. Use of the Restraint Checklist is highly recommended.
8. If the above actions are unsuccessful, or if the patient is resisting the restraints, consider administering medications per protocol. (Chemical restraint may be considered earlier.)
9. If a patient is restrained by law enforcement personnel with handcuffs or other devices EMS personnel can not remove, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Spinal Immobilization

Clinical Indications:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Need for spinal immobilization as determined by protocol

Procedure:

1. Gather a backboard, straps, C-collar appropriate for patient's size, tape, and head rolls or similar device to secure the head.
2. Explain the procedure to the patient
3. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the C-spine. This stabilization, to be provided by a second rescuer, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first rescuer applied the collar.
4. Once the collar is secure, the second rescuer should still maintain their position to ensure stabilization (the collar is helpful but will not do the job by itself.)
5. Place the patient on a long spine board with the log-roll technique if the patient is supine or prone. For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on a backboard by the safest method available that allows maintenance of in-line spinal stability.
6. Stabilize the patient with straps and head rolls/tape or other similar device. Once the head is secured to the backboard, the second rescuer may release manual in-line stabilization.
7. NOTE: Some patients, due to size or age, will not be able to be immobilized through in-line stabilization with standard backboards and C-collars. Never force a patient into a non-neutral position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital. Special equipment such as football players in full pads and helmet may remain immobilized with helmet and pads in place.
8. Document the time of the procedure in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Splinting

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Immobilization of an extremity for transport, either due to suspected fracture, sprain, or injury.
- Immobilization of an extremity for transport to secure medically necessary devices such as intravenous catheters

Procedure:

1. Assess and document pulses, sensation, and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.
2. Remove all clothing from the extremity.
3. Select a site to secure the splint both proximal and distal to the area of suspected injury, or the area where the medical device will be placed.
4. Do not secure the splint directly over the injury or device.
5. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess
7. If a femur fracture is suspected and there is no evidence of pelvic fracture or instability, the following procedure may be followed for placement of a femoral traction splint:
    - Assess neurovascular function as in #1 above.
    - Place the ankle device over the ankle.
    - Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis
    - Extend the distal end of the splint at least 6 inches beyond the foot.
    - Attach the ankle device to the traction crank.
    - Twist until moderate resistance is met.
    - Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.
8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Stroke Screen: LA Prehospital

Clinical Indications:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Suspected Stroke Patient

Procedure:

1. Assess and treat suspected stroke patients as per protocol.
2. The Los Angeles Prehospital Stroke Screen (LAPSS) form should be completed for all suspected stroke patients (see appendix). There are six screening criteria items on the LAPSS form.
3. Screen the patient for the following criteria:
   - Age over 45 years
   - No history of a seizure disorder
   - New onset of symptoms in last 24 hours
   - Patient ambulatory prior to event
   - Blood glucose between 60-400
4. The final criterion consists of performing a patient exam looking for facial droop, unilateral grip weakness/absence, or unilateral arm weakness. One of these exam components must be positive to answer "yes" on the screening form.
5. **If all of the LAPSS screening criteria are met ("yes" to all criteria OR if unknown), follow the EMS System Stroke Plan and alert the receiving hospital of a possible stroke patient as early as possible.**
6. All sections of the LAPSS form must be completed.
7. The completed LAPSS form should be attached or documented in the PCR.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Temperature Measurement

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Monitoring body temperature in a patient with suspected infection, hypothermia, hyperthermia, or to assist in evaluating resuscitation efforts.

Procedure:

1. For adult patients that are conscious, cooperative, and in no respiratory distress, an oral temperature is preferred (steps 3 to 5 below). For infants or adults that do not meet the criteria above, a rectal temperature is preferred (steps 6 to 8 below).
2. To obtain an oral temperature, ensure the patient has no significant oral trauma and place the thermometer under the patient's tongue with appropriate sterile covering.
3. Have the patient seal their mouth closed around thermometer.
4. If using an electric thermometer, leave the device in place until there is indication an accurate temperature has been recorded (per the "beep" or other indicator specific to the device). If using a traditional thermometer, leave it in place until there is no change in the reading for at least 30 seconds (usually 2 to 3 minutes). Proceed to step 9.
5. Prior to obtaining a rectal temperature, assess whether the patient has suffered any rectal trauma by history and/or brief examination as appropriate for patient's complaint.
6. To obtain a rectal temperature, cover the thermometer with an appropriate sterile cover, apply lubricant, and insert into rectum no more than 1 to 2 cm beyond the external anal sphincter.
7. Follow guidelines in step 5 above to obtain temperature.
8. Record time, temperature, method (oral, rectal), and scale (C° or F°) in Patient Care Report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Urinary Catheterization

Clinical Indications:

P EMT- P P

- Monitoring a patient's fluid status and/or response to therapy during transport.
- Collection of urine for laboratory analysis.
- Patients with medical (but NOT TRAUMA) complaints over the age of 16.

Procedure:

1. Explain the procedure to the patient. Maximize patient privacy. Have a second crewmember or other chaperone if performing the procedure on a member of the opposite sex.
2. If there is any question of traumatic injury in the Genitourinary (GU) region, do not perform this procedure.
3. Open the catheter kit. Test the balloon at the catheter tip. Connect the catheter to the urine collection system. Maintain the sterility of contents.
4. Use sterile gloves from the kit. Use one hand to come in contact with the patient and the other to use items from the kit. Recall that once your hand touches the patient, it is no longer sterile and cannot be used to obtain items from the kit.
5. Using the Betadine swabs from the kit, thoroughly cleanse the area surrounding the urethra. For males, this will require retracting the foreskin for uncircumcised males and cleansing of the glans for all males. For females, this will require retraction of the labia majora and cleansing of the area around the urethra.
6. Once the patient has been prepped with Betadine, place sterile sheet(s).
7. Lubricate the tip of the catheter.
8. Gently guide the catheter through the external opening of the urethra. Advance the catheter slowly until there is return of urine. Do not force the catheter through resistance. If resistance is encountered, withdraw the catheter slightly and gently re-direct the catheter.
9. Once urine is returned, gently inflate the balloon and secure the urine collection device.
10. Record procedure and amount of urine returned in the Patient Care Report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Venous Access: Blood Draw

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Collection of a patient's blood for laboratory analysis

Procedure:

1. Utilize universal precautions as per OSHA.
2. Select vein and prep as usual.
3. Select appropriate blood-drawing devices.
4. Draw appropriate tubes of blood for lab testing.
5. Assure that the blood samples are labeled with the correct information (a minimum of the patients name, along with the date and time the sample was collected).
6. Deliver the blood tubes to the appropriate individual at the hospital.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Venous Access: Central Line Maintenance

Clinical Indications:

P EMT- P P

- Transport of a patient with a central venous pressure line already in place

Procedure:

1. Prior to transportation, ensure the line is secure.
2. Medications and IV fluids may be administered through a central venous pressure line. Such infusions must be held while the central venous pressure is transduced to obtain a central venous pressure, but may be restarted afterwards.
3. Do not manipulate the central venous catheter.
4. If the central venous catheter becomes dysfunctional, does not allow drug administration, or becomes dislodged, contact medical control.
5. Document the time of any pressure measurements, the pressure obtained, and any medication administration in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Venous Access: Existing Catheters

Clinical Indications:

P EMT- P P

- Inability to obtain adequate peripheral access.
- Access of an existing venous catheter for medication or fluid administration.
- Central venous access in a patient in cardiac arrest.

Procedure:

1. Clean the port of the catheter with alcohol wipe.
2. Using sterile technique, withdraw 5-10 ml of blood and discard syringe in sharps container.
3. Using 5cc of normal saline, access the port with sterile technique and gently attempt to flush the saline.
4. If there is no resistance, no evidence of infiltration (e.g., no subcutaneous collection of fluid), and no pain experienced by the patient, then proceed to step 4. If there is resistance, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, do not use the catheter.
5. Begin administration of medications or IV fluids slowly and observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.
6. Record procedure, any complications, and fluids/medications administered in the Patient Care Report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Venous Access: External Jugular Access

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- External jugular vein cannulation is indicated in a critically ill patient ≥ 8 years of age who requires intravenous access for fluid or medication administration and in whom an extremity vein is not obtainable.
- External jugular cannulation can be attempted initially in life threatening events where no obvious peripheral site is noted.

Procedure:

1. Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
3. Prep the site as per peripheral IV site.
4. Align the catheter with the vein and aim toward the same side shoulder.
5. "Tourniqueting" the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
6. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
7. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Venous Access: Extremity

I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Any patient where intravenous access is indicated (significant trauma, emergent or potentially emergent medical condition).

Procedure:

1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the ALS professional.
2. Paramedics can use intraosseous access where threat to life exists as provided for in the Venous Access-Intraosseous procedure.
3. Use the largest catheter bore necessary based upon the patient's condition and size of veins.
4. Fluid and setup choice is preferably:
   - Lactated Ringers with a macro drip (10 gtt/cc) for burns
   - Normal Saline with a macro drip (10 gtt/cc) for medical conditions, trauma or hypotension
   - Normal Saline with a micro drip (60 gtt/cc) for medication infusions
5. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
6. Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing bleeding all air bubbles from the line.
7. Place a tourniquet around the patient's extremity to restrict venous flow only.
8. Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
9. Prep the skin with an antiseptic solution.
10. Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
11. Advance the catheter into the vein. **Never** reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
12. Draw blood samples when appropriate.
13. Remove the tourniquet and connect the IV tubing or saline lock.
14. Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.

    Rates are preferably:
    - Adult: KVO: 60 cc/hr (1 gtt/ 6 sec for a macro drip set)
    - Pediatric: KVO: 30 cc/hr (1 gtt/ 12 sec for a macro drip set)

    If shock is present:
    - Adult: 500 cc fluid boluses repeated as long as lungs are dry and BP < 90. Consider a second IV line.
    - Pediatric: 20 cc/kg blouses repeated PRN for poor perfusion.
15. Cover the site with a sterile dressing and secure the IV and tubing.
16. Label the IV with date and time, catheter gauge, and name/ID of the person starting the IV.
17. Document the procedure, time and result (success) on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Venous Access: Femoral Line – Page 1 of 2

P EMT- P P

Clinical Indications:

- Central venous access in a patient with an urgent need for fluid or medication administration.
- Inability to obtain adequate peripheral access.
- Patient aged greater than 16 years.
- No evidence of pelvic trauma.
- No evidence of trauma in the extremity in which the catheter is to be placed.

Procedure:

1. Obtain central access kit with 6.0 to 8.0 French cordis and equipment to place catheter by Selinger technique.
2. Completely expose the groin area on the side where the catheter is to be placed.
3. Palpate the femoral pulse in the inguinal crease. Recall that the inguinal ligament connects the pubic symphysis with the anterior, superior iliac spine and that all attempts at access should be made inferior to this ligament to avoid inadvertent entry into the abdominal cavity.
4. Once the femoral pulse has been palpated distal to the ilio-inguinal ligament, prep a large area of the skin with Betadine.
5. Use sterile gloves and place sterile drapes around the Betadine-prepped field.
6. With one hand, palpate the femoral pulse. The femoral vein will be located medially when compared with the femoral artery.
7. With the introducing needle from the kit, enter the skin over the anticipated position of the femoral vein. Gently aspirate as the needle is advanced. Angle the needle approximately 45 to 60 degrees in reference to the skin on the thigh.
8. Once non-pulsatile, venous blood is obtained, stop advancing the needle and hold the needle in position. Remove the syringe and observe the hub for pulsatile flow. If the blood appears arterial and/or is pulsatile, immediately remove the needle and apply direct pressure over the site. Once bleeding is controlled, return to step 7 above or consider the other extremity, if there are no contraindications.
9. If the needle appears to be in the femoral vein, insert the guide wire with sterile technique. Stop advancing the wire if there is any resistance; you may gently withdraw the wire and attempt re-insertion so long as sterility is maintained.
10. Stop advancing the wire in order to leave approximately 10 cm of the wire external to the hub of the needle.
11. **DO NOT LET GO OF THE WIRE.**
12. Holding the wire in the distal hand, remove the needle over the wire. Once the needle reaches the end of the wire, use the proximal hand to control the wire and the distal hand to remove the needle from the wire.
13. Use the scalpel to create a small incision in the skin at the base of the wire. Make certain the incision extends completely to the wire so there is no skin tag.

CONTINUED VENOUS ACCESS: FEMORAL LINE - PAGE 2

14. Place the catheter over the wire; use the wire a guide to place the catheter. Some
15. Gentle force may be required as the catheter enters the skin; this should not, however, require excessive force. Again, one hand should always maintain control of the wire.
16. Once the catheter is completely inserted, remove the wire.
17. Attach a syringe to the port of the catheter, release the clamp, and aspirate for blood. There should be an easy flow of venous blood.
18. Once all of the air has been removed from the catheter by aspirating blood, re-clamp the line.
19. Attach the desired IV fluid/blood/etc and begin infusion. **Note that "wide-open" lines will deliver large amounts of fluid quickly – monitor the patient's fluid status closely.**
20. Secure the catheter with sterile dressing or sutures.
21. Document procedure, complications, and clinical results in the patient care report (PCR)

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

North Carolina College of Emergency Physicians
Standards Procedure (Skill)
Venous Access: Intraosseous

P EMT- P P

Clinical Indications:

- Patients where rapid, regular IV access is unavailable with any of the following:
- Cardiac arrest.
- Multisystem trauma with severe hypovolemia.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure / Respiratory arrest.
- Burns.

Contraindications:

- Fracture proximal to proposed intraosseous site.
- History of Osteogenesis Imperfecta
- Current or prior infection at proposed intraosseous site.
- Previous intraosseous insertion or joint replacement at the selected site.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Identify anteromedial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this. If this site is not suitable, and patient >12 years of age, identify the anteriormedial aspect of the distal tibia (2 cm proximal to the medial malleolus). Proximal humerus is also an acceptable insertion site: for patients > 40 Kg, lateral aspect of the humerus, 2 cm distal to the greater tuberosity.
3. Prep the site recommended by the device manufacturer with providone-iodine ointment or solution.
4. For manual pediatric devices, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further.
5. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, power the driver until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further. Utilize the yellow needle for the proximal humerus. The pink needle is only intended for use in neonatal patients.
6. For the Bone Injection Gun (BIG), find and mark the manufacturers recommended site. Position the device and pull out the safety latch. Trigger the BIG at 90° to the surface and remove the injection device.
7. Remove the stylette and place in an approved sharps container.
8. Attach a syringe filled with at least 5 cc NS; aspirate bone marrow for manual devices only, to verify placement; then inject at least 5 cc of NS to clear the lumen of the needle.
9. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.
10. Stabilize and secure the needle with dressings and tape.
11. You may administer 10 to 20 mg (1 to 2 cc) of 2% Lidocaine in adult patients who experience infusion-related pain. This may be repeated prn to a maximum of 60 mg (6 cc).
12. Following the administration of any IO medications, flush the IO line with 10 cc of IV fluid.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Venous Access: Swan-Ganz Catheter Maintenance

Clinical Indications:

P EMT- P P

- Transport of a patient with a Swan-Ganz catheter that is in place prior to transport.

Procedure:

1. Make certain catheter is secure prior to transport.
2. Under the supervision of the nurse or physician caring for the patient, make certain the transport personnel are aware of the depth at which the catheter is secured.
3. **UNDER NO CIRCUMSTANCES SHOULD TRANSPORT PERSONNEL ADVANCE THE SWAN-GANZ CATHETER.**
4. The sterile plastic sheath that surrounds the catheter should not be manipulated.
5. The ports of the catheter may be used to continue administration of medications or IV fluids that were initiated prior to transport. These should be used as any other IV port with attention to sterile technique.
6. If applicable, measurements from the catheter may be obtained during transport and used to guide care as per local protocols and medical control orders.
7. If at anytime during the transport difficulties with the function of the Swan-Ganz catheter is noted, contact medical control.
8. Document the time and any adjustments or problems associated with the catheter in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Wound Care-General

Clinical Indications:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

- Protection and care for open wounds prior to and during transport.

Procedure:

1. Use personal protective equipment, including gloves, gown, and mask as indicated.
2. If active bleeding, elevate the affected area if possible and hold direct pressure. Do not rely on "compression" bandage to control bleeding. Direct pressure is much more effective.
3. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate (this may have to be avoided if bleeding was difficult to control). Consider analgesia per protocol prior to irrigation.
4. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
5. Monitor wounds and/or dressings throughout transport for bleeding.
6. Document the wound and assessment and care in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Wound Care-Hemostatic Agent

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Serious hemorrhage that can not be controlled by other means.

Contraindications:

- Wounds involving open thoracic or abdominal cavities.

Procedure:

1. Apply approved non-heat-generating hemostatic agent per manufacturer's instructions.
2. Supplement with direct pressure and standard hemorrhage control techniques.
3. Apply dressing.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Wound Care-Taser® Probe Removal

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Patient with uncomplicated conducted electrical weapon (Taser®) probes embedded subcutaneously in non-sensitive areas of skin.
- Taser probes are barbed metal projectiles that may embed themselves up to 13 mm into the skin.

Contraindications:

- Patients with conducted electrical weapon (Taser®) probe penetration in vulnerable areas of body as mentioned below should be transported for further evaluation and probe removal
- Probes embedded in skin above level of clavicles, female breasts, or genitalia
- Suspicion that probe might be embedded in bone, blood vessel, or other sensitive structure.

Procedure:

- Ensure wires are disconnected from weapon.
- Stabilize skin around probe using non-dominant hand.
- Grasp probe by metal body with pliers or hemostats to prevent puncture wounds to EMS personnel.
- Remove probe in single quick motion.
- Wipe wound with antiseptic wipe and apply dressing.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Wound Care-Tourniquet

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

Clinical Indications:

- Life threatening extremity hemorrhage that can not be controlled by other means.
- Serious or life threatening extremity hemorrhage and tactical considerations prevent the use of standard hemorrhage control techniques.

Contraindications:

- Non-extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical

Procedure:

1. Place tourniquet proximal to wound
2. Tighten per manufacturer instructions until hemorrhage stops and/or distal pulses in affected extremity disappear.
3. Secure tourniquet per manufacturer instructions
4. Note time of tourniquet application and communicate this to receiving care providers
5. Dress wounds per standard wound care protocol
6. If delayed or prolonged transport and tourniquet application time > 45 minutes: consider reattempting standard hemorrhage control techniques and removing tourniquet

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Table of Contents

Air Transport

Policy:

Air transport should be utilized whenever patient care can be improved by decreasing transport time or by giving advanced care not available from ground EMS services, but available from air medical transport services (i.e. blood).

Purpose:

The purpose of this policy is to:

- Improve patient care in the prehospital setting.
- Allow for expedient transport in serious, mass casualty settings.
- Provide life-saving treatment such as blood transfusion.

Procedure:

Patient transportation via ground ambulance will not be delayed to wait for helicopter transportation. If the patient is packaged and ready for transport and the helicopter is not on the ground, or within a reasonable distance, the transportation will be initiated by ground ambulance. Air medical services may be rerouted to a helipad located at or near a medical facility.

If the transport plan includes delivery of the patient to a helipad located at a qualified medical facility, it may be appropriate to bypass the Emergency Department. When bypassing the emergency Department, the following will apply:

- Notify the facility via radio of the “Bypass”. It is important to use the term “Bypass”. This will be the phrase that initiates the event for the facility.
- Provide a full encode to the facility as if the patient were being delivered to the Emergency Department.
- Update the Emergency Department to any changes in the patient condition.
- Be prepared to divert to the Emergency Department if conditions warrant.
- Follow facility specific guidelines outlined in this document.
- This policy may only be utilized at facilities with specific guidelines.

Air transport should be considered if any of the following criteria apply**:**

- High priority patient with > 20 minute transport time
- Entrapped patients with > 10 minute estimated extrication time
- Multiple casualty incident with red/yellow tag patients
- Multi-trauma or medical patient requiring life-saving treatment not available in prehospital environment (i.e., blood transfusion, invasive procedure, operative intervention)

When the need for air medical services is identified, a request should be made through Rowan Communications. Only EMT-P personnel can activate air medical resources. EMT-P personnel should be on the scene or in contact with individuals on the scene in order to make an informed decision on transport. It is not necessary to check the availability of flight services and this practice is to be avoided.

This policy has been altered from the original 2009 NCCEP Policy by the local EMS Medical Director

If the scene conditions or patient situation improves after activation of the air medical transport service and air transport is determined not to be necessary, paramedic or administrative personnel may cancel the request for air transport.

Minimal Information which should be provided to the air medical transport service include:

- Number of patients
- Age of patients
- Sex of patients
- Mechanism of injury or complaint (MVC, fall, etc)

Facility Specific Guidelines

Rowan Regional Medical Center

- Approach the Emergency Department in the same manner as a normal emergency response.
- Remove the patient from the EMS unit and stage inside the ED entrance between the Emergency Department and the elevator lobby.
- Remain in the staging area until the aircraft is on the helipad. Under no circumstances will an EMS crew wait in any area other than the staging area or Emergency Department.
- Proceed to the helipad when the aircraft is available. Do not wait for the flight crew to come to the patient. The flight crew should accept the patient on the helipad.
- Should the patient deteriorate or need additional stabilization prior to transport, the patient may be delivered to the Emergency Department.
- Upon delivery to the Emergency Department, care is transferred to the facility and all patient care decisions and documentation become the responsibility of Rowan Regional Medical Center.

CMC-Northeast

- Approach the Emergency Department in the same manner as a normal emergency response.
- Stage the EMS unit in the area adjacent to the helipad entrance.
- Remain in the EMS unit until the aircraft is on the helipad. Under no circumstances will an EMS crew wait in any area other than the staging area or Emergency Department.
- Allow the flight crew to accept the patient in the EMS unit.
- Proceed to the helipad at the direction of the flight crew.
- Should the patient deteriorate or need additional stabilization prior to transport, the patient may be delivered to the Emergency Department.
- Upon delivery to the Emergency Department, care is transferred to the facility and all patient care decisions and documentation become the responsibility of CMC-Northeast.

Standards Policy

Child Abuse Recognition and Reporting

Policy:

Child abuse is the physical and mental injury, sexual abuse, negligent treatment, or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare. The recognition of abuse and the proper reporting is a critical step to improving the safety of children and preventing child abuse.

Purpose:

Assessment of a child abuse case based upon the following principles:

- **Protect** the life of the child from harm, as well as that of the EMS team from liability.
- **Suspect** that the child may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
- **Respect** the privacy of the child and family.
- **Collect** as much evidence as possible, especially information.

Procedure:

1. With all children, assess for and document psychological characteristics of abuse, including excessively passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, fussy behavior, hyperactivity, or other behavioral disorders

2. With all children, assess for and document physical signs of abuse, including especially any injuries that are inconsistent with the reported mechanism of injury.

3. With all children, assess for and document signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.

4. Immediately report any suspicious findings to both the receiving hospital (if transported) and to agency responsible for Social Services in the county. After office hours, the child protective services worker on call can be contacted by the EMS System's 911 communications center. While law enforcement may also be notified, North Carolina law requires the EMS provider to report the suspicion of abuse to DSS. EMS should not accuse or challenge the suspected abuser. This is a legal requirement to report, not an accusation. In the event of a child fatality, law enforcement must also be notified.

This policy has been altered from the original 2012 NCCEP Policy by the local EMS Medical Director

Child with Special Health Care Needs (NC Kidbase)

Policy:

Medical technology, changes in the healthcare industry, and increased home health capabilities have created a special population of patients that interface with the EMS system. It is important for EMS to understand and provide quality care to children with special health care needs.

Purpose:

The purpose of this policy is to:

- Provide quality patient care and EMS services to children with special health care needs.
- Understand the need to communicate with the parents and caregivers regarding healthcare needs and devices that EMS may not have experience with.
- Promote, request, and use the "Kidbase" form, which catalogs the health care problems, needs, and issues of each child with a special healthcare need.

Procedure:

1. Caregivers who call 911 to report an emergency involving a child with special health care needs may report that the emergency involves a "Kidbase child" (if they are familiar with the NC Kidbase program) or may state that the situation involves a special needs child.

2. Responding EMS personnel should ask the caregiver of a special needs child for a copy of the "Kidbase Form", which is the North Carolina terminology for the Emergency Information Form (EIF).

3. EMS personnel may choose to contact the child's primary care physician for assistance with specific conditions or devices or for advice regarding appropriate treatment and/or transport of the child in the specific situation.

4. Transportation of the child, if necessary, will be made to the hospital appropriate for the specific condition of the child. In some cases this may involve bypassing the closest facility for a more distant yet more medically appropriate destination.

Criteria for Death / Withholding Resuscitation

Policy:

CPR and ALS treatment are to be withheld only if the patient is obviously dead or a valid North Carolina ***MOST and/or Do Not Resuscitate*** form (see separate policy) is present.

Purpose:

The purpose of this policy is to:

- Honor those who have obviously expired prior to EMS arrival.

Procedure:

1. If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria below, CPR and ALS therapy need not be initiated:

    - Body decomposition
    - Rigor mortis
    - Dependent lividity
    - Blunt force trauma
    - Injury not compatible with life (i.e., decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction)
    - Extended downtime with Asystole on the ECG

2. If a bystander or first responder has initiated CPR or automated defibrillation prior to an EMS paramedic's arrival and any of the above criteria (signs of obvious death) are present, the paramedic may discontinue CPR and ALS therapy. All other EMS personnel levels must communicate with medical control prior to discontinuation of the resuscitative efforts.

3. If doubt exists, start resuscitation immediately. Once resuscitation is initiated, continue resuscitation efforts until either:
    a) Resuscitation efforts meet the criteria for implementing the **Discontinuation of Prehospital Resuscitation Policy** (see separate policy)
    b) Patient care responsibilities are transferred to the destination hospital staff.

Standards Policy

Deceased Subjects

Policy:

EMS will handle the disposition of deceased subjects in a uniform, professional, and timely manner.

Purpose:

The purpose of this policy is to:

- Organize and provide for a timely disposition of any deceased subject
- Maintain respect for the deceased and family
- Allow EMS to return to service in a timely manner.

Procedure:

1. Do not remove lines or tubes from unsuccessful cardiac arrests/codes unless directed below.

2. Notify the law enforcement agency with jurisdiction if applicable.

3. If subject was found deceased by EMS, the scene is turned over to law enforcement.

4. If EMS has attempted to resuscitate the patient and then terminated the resuscitative efforts, the EMS personnel may assist law enforcement with contacting the family physician (medical cases) or medical examiner (traumatic cases or family physician unavailable) to provide information about the resuscitative efforts.

5. Transport arrangements should be made in concert with law enforcement and the family's wishes.

6. If the deceased subject's destination is other than the county morgue, any line(s) or tube(s) placed by EMS should be removed prior to transport.

7. Document the situation, name of Physician or Medical Examiner contacted, the agency providing transport of the deceased subject, and the destination on the patient care report form (PCR).

This policy has been altered from the original 2012 NCCEP Policy by the local EMS Medical Director

Discontinuation of Prehospital Resuscitation

Policy:

Unsuccessful cardiopulmonary resuscitation (CPR) and other advanced life support (ALS) interventions may be discontinued prior to transport or arrival at the hospital when this procedure is followed.

Purpose:

The purpose of this policy is to:

- Allow for discontinuation of prehospital resuscitation after the delivery of adequate and appropriate ALS therapy.

Procedure:

1. Discontinuation of CPR and ALS intervention may be implemented **prior to contact with Medical Control if <u>ALL</u>** of the following criteria have been met:

    - Patient must be 18 years of age or older
    - Adequate CPR has been administered
    - Airway has been successfully managed with verification of device placement. Acceptable management techniques include orotracheal intubation, nasotracheal intubation, Blind Insertion Airway Device (BIAD) placement, or cricothyrotomy
    - IV or IO access has been achieved
    - No evidence or suspicion of any of the following:
        -Drug/toxin overdose **-Active internal bleeding**
        -Hypothermia **-Preceding trauma**
    - Rhythm appropriate medications and defibrillation have been administered according to local EMS Protocols for a total of 3 cycles of drug therapy without return of spontaneous circulation (palpable pulse)
    - All EMS paramedic personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate

2. If all of the above criteria are not met and discontinuation of prehospital resuscitation is desired, **contact Medical Control**.

3. The **Deceased Subjects Policy** should be followed.

Document all patient care and interactions with the patient's family, personal physician, medical examiner, law enforcement, and medical control in the EMS patient care report (PCR).

Disposition (Patient Instructions)

Policy:

All patient encounters responded to by EMS will result in the accurate and timely completion of:

- The Patient Care Report (PCR) for all patients transported by EMS
- The Patient Disposition Form for all patients not transported by EMS

Purpose:

To provide for the documentation of:

- The evaluation and care of the patient
- The patient's refusal of the evaluation, treatment, and/or transportation
- The patient's disposition instructions
- The patient's EMS encounter to protect the local EMS system and its personnel from undue risk and liability.

Procedure:

1. All patient encounters, which result in some component of an evaluation, must have a Patient Care Report completed.

2. All patients who refuse any component of the evaluation or treatment, based on the complaint, must have a Disposition Form completed.

3. All patients who are NOT transported by EMS must have a Disposition (patient instruction) Form completed including the Patient Instruction Section.

4. A copy of the Patient Disposition Form should be maintained with the official Patient Care Report (PCR)

North Carolina Do Not Resuscitate and MOST Form

Policy:

Any patient presenting to any component of the EMS system with a completed **North Carolina *Do Not Resuscitate* (DNR)** form (yellow form) and/or **MOST (Medical Orders for Scope of Treatment)** form (bright pink form) shall have the form honored. Treatment will be limited as documented on the DNR or MOST form.

Purpose:

- To honor the terminal wishes of the patient
- To prevent the initiation of unwanted resuscitation

Procedure:

1. When confronted with a patient or situation involving the NC DNR and/or MOST form(s), the following form content must be verified before honoring the form(s) request.

    - The form(s) must be an original North Carolina DNR form (yellow form - not a copy) and/or North Carolina MOST form (bright pink – not a copy)
    - The effective date and expiration date must be completed and current
    - The DNR and/or MOST Form must be signed by a physician, physician's assistant, or nurse practitioner.

2. A valid DNR or MOST form may be overridden by the request of:

    - The patient
    - The guardian of the patient
    - An on-scene physician

    If the patient or anyone associated with the patient requests that a NC DNR and/or MOST form not be honored, EMS personnel should contact **Medical Control** to obtain assistance and direction

3. A living will or other legal document that identifies the patient's desire to withhold CPR or other medical care may be honored with the approval of **Medical Control**. This should be done when possible in consultation with the patient's family and personal physician.

Standards Policy

EMS Documentation and Data Quality

Policy:

The complete EMS documentation associated with an EMS events service delivery and patient care shall be electronically recorded into a Patient Care Report (PCR) within 24 hours of the completion of the EMS event with an average EMS Data Score of 5 or less.

Definition:

The EMS documentation of a Patient Care Report (PCR) is based on the appropriate and complete documentation of the EMS data elements as required and defined within the North Carolina College of Emergency Physician's EMS Standards (www.NCCEP.org). Since each EMS event and/or patient scenario is unique, only the data elements relevant to that EMS event and/or patient scenario should be completed.

The EMS Data Score is calculated on each EMS PCR as it is electronically processed into the North Carolina PreHospital Medical Information System (PreMIS). Data Quality Scores are provided within PreMIS and EMS Toolkit Reports. The best possible score is a 0 (zero) and with each data quality error a point is added to the data quality score.

A complete Patient Care Report (PCR) must contain the following information (as it relates to each EMS event and/or patient):

- Service delivery and Crew information regarding the EMS Agency's response
- Dispatch information regarding the dispatch complaint, and EMD card number
- Patient care provided prior to EMS arrival
- Patient Assessment as required by each specific complaint based protocol
- Past medical history, medications, allergies, and DNR/MOST status
- Trauma and Cardiac Arrest information if relevant to the EMS event or patient
- All times related to the event
- All procedures and their associated time
- All medications administered with their associated time
- Disposition and/or transport information
- Communication with medical control
- Appropriate Signatures (written and/or electronic)

Purpose:

The purpose of this policy is to:

- Promote timely and complete EMS documentation.
- Promote quality documentation that can be used to evaluate and improve EMS service delivery, personnel performance, and patient care to the county's citizens.
- Promote quality documentation that will decrease EMS legal and risk management liability.
- Provide a means for continuous evaluation to assure policy compliance.

EMS Documentation and Data Quality

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. The EMS Patient Care Report (PCR) shall be completed as soon as possible after the time of the patient encounter. **Documentation should be completed prior to leaving the destination facility unless call demand dictates otherwise, in which case documentation must be completed prior to the end of the personnel's shift.**

2. **A copy of the patient care report form SHOULD be provided to the receiving medical facility. If the final PCR is not available at the time the patient is left with the emergency department or other healthcare facility, an interim report such as the PreMIS Preliminary Report Form MUST be provided.**

3. The PCR must be completed in the PreMIS System or electronically submitted to the PreMIS System within 24 hours of the EMS event or patient encounter's completion. The EMS data quality feedback provided at the time of the electronic submission into PreMIS should be reviewed and when possible any identified errors will be corrected within each PCR. Each PCR may be electronically resubmitted to PreMIS as many times as needed.

4. The EMS Data Quality Scores for the EMS System, EMS Agency, and individual EMS personnel will be reviewed regularly within the EMS System Peer Review Committee.

Standards Policy

Documentation of Vital Signs

Policy:

Every patient encounter by EMS will be documented. Vital signs are a key component in the evaluation of any patient and a complete set of vital signs is to be documented for any patient who receives some assessment component.

Purpose:

To insure:

- Evaluation of every patient's volume and cardiovascular status
- Documentation of a complete set of vital signs

Procedure:

1. An **initial** complete set of vital signs includes:
    - Pulse rate
    - Systolic **AND** diastolic blood pressure
    - Respiratory rate
    - Pain / severity (when appropriate to patient complaint)
    - GCS for Injured Patients

2. When no ALS treatment is provided, palpated blood pressures are acceptable for **REPEAT** vital signs.

3. Based on patient condition and complaint, vital signs may also include:
    - Pulse Oximetry
    - Temperature
    - End Tidal CO2 (If Invasive Airway Procedure)
    - Breath Sounds
    - Level of Response

4. If the patient refuses this evaluation, the patient's mental status and the reason for refusal of evaluation must be documented. A patient disposition form must also be completed.

5. Document situations that preclude the evaluation of a complete set of vital signs.

6. Record the time vital signs were obtained.

7. Any abnormal vital sign should be repeated and monitored closely.

Standards Policy
Domestic Violence (Partner and/or Elder Abuse) Recognition and Reporting

Policy:

Domestic violence is physical, sexual, or psychological abuse and/or intimidation, which attempts to control another person in a current or former family, dating, or household relationship. The recognition, appropriate reporting, and referral of abuse is a critical step to improving patient safety, providing quality health care, and preventing further abuse.

Elder abuse is the physical and/or mental injury, sexual abuse, negligent treatment, or maltreatment of a senior citizen by another person. Abuse may be at the hand of a caregiver, spouse, neighbor, or adult child of the patient. The recognition of abuse and the proper reporting is a critical step to improve the health and wellbeing of senior citizens.

Purpose:

Assessment of an abuse case based upon the following principles:

- **Protect** the patient from harm, as well as protecting the EMS team from harm and liability.
- **Suspect** that the patient may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
- **Respect** the privacy of the patient and family.
- **Collect** as much information and evidence as possible and preserve physical evidence.

Procedure:

1. Assess the/all patient(s) for any psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, behavioral disorders, substance abuse, medical non-compliance, or repeated EMS requests. This is typically best done in private with the patient.
2. Assess the patient for any physical signs of abuse, especially any injuries that are inconsistent with the reported mechanism of injury. Defensive injuries (e.g. to forearms), and injuries during pregnancy are also suggestive of abuse. Injuries in different stages of healing may indicate repeated episodes of violence.
3. Assess all patients for signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. Immediately report any suspicious findings to both the receiving hospital (if transported). If an elder or disabled adult is involved, also contact the Department of Social Services (DSS) or equivalent in the county. After office hours, the adult social services worker on call can be contacted by the 911 communications center.
5. EMS personnel should attempt in private to provide the patient with the phone number of the local domestic violence program, or the **National Hotline, 1-800-799-SAFE**.

Standards Policy

EMS Back in Service Time

Policy:

All EMS Units transporting a patient to a medical facility shall transfer the care of the patient and complete all required operational tasks to be back in service for the next potential EMS event within 30 minutes of arrival to the medical facility, 90% of the time.

Definition:

The EMS Back in Service Time is defined as the time interval beginning with the time the transporting EMS Unit arrives at the medical facility destination and ending with the time the EMS Unit checks back in service and available for the next EMS event.

Purpose:

The purpose of this policy is to:

- Assure that the care of each EMS patient transported to a medical facility is transferred to the medical facility staff in a timely manner.
- Assure that the EMS unit is cleaned, disinfected, restocked, and available for the next EMS event in a timely manner.
- Assure that an interim or complete EMS patient care report (PCR) is completed and left with the receiving medical facility documenting, at a minimum, the evaluation and care provided by EMS for that patient (It is acceptable to leave the PreMIS Preliminary Report or equivalent if the final PCR cannot be completed before leaving the facility).
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. The EMS Unit's priority upon arrival at the medical facility will be to transfer the care of the patient to medical facility staff as soon as possible.

2. EMS personnel will provide a verbal patient report on to the receiving medical facility staff.

3. EMS personnel will provide an interim (PreMIS Preliminary Report or equivalent) or final Patient Care Report (PCR) to the receiving medical facility staff, prior to leaving the facility, that documents at a minimum the patient's evaluation and care provided by EMS prior to arrival at the medical facility. A complete PCR should be completed as soon as possible but should not cause a delay in the EMS Back in Service Time.

4. The EMS Unit will be cleaned, disinfected, and restocked (if necessary) during the EMS Back in Service Time interval.

5. Any EMS Back in Service Time delay resulting in a prolonged EMS Back in Service Time will be documented in Patient Care Report (PCR) as an "EMS Turn-Around Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.

6. All EMS Turn-Around Delays will be reviewed regularly within the EMS System Peer Review Committee.

EMS Dispatch Center Time

Policy:

The EMS Dispatch Center Time will be less than 90 seconds, 90% of the time, for all events identified and classified as an emergent or hot (with lights and siren) response.

Definition:

The EMS Dispatch Center Time is defined as the time interval beginning with the time the initial 911 phone call rings at the 911 Communications Center requesting emergency medical services and ending with the dispatch time of the EMS Unit responding to the event.

Purpose:

The purpose of this policy is to:

- Provide the safest and most appropriate level of response to all EMS events within the EMS System.
- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. A public calls into the 911 Communications Center requesting emergency medical assistance will never be required to speak with more than two persons before a formal EMS Unit is dispatched.

2. In EMS Dispatch Centers where Emergency Medical Dispatch (EMD) has been implemented, EMS Units will be dispatched by EMD certified personnel in accordance with the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.

3. EMS Units will be dispatched hot (with lights and sirens) or cold (no lights and sirens) by the 911 Call Center based on predetermined criteria. If First Responders are dispatched as a component of the EMS response, they should typically be dispatched hot (with lights and sirens).

4. Without question, exception, or hesitation, EMS Units will respond as dispatched (hot or cold). This includes both requests to respond on active calls and requests to "move-up" to cover areas of the System that have limited EMS resources available.

5. EMS Units may, at their discretion, request for a First Responder on Non-First Responder calls in situations where additional resources are required such as manpower, extreme response time of the EMS Unit, need for forcible entry, etc.

EMS Dispatch Center Time

6. EMS Units dispatched with a cold (no lights and sirens) response, will not upgrade to a hot (with lights and sirens) response **UNLESS**:
   - Public Safety personnel on-scene requests a hot (with lights and sirens) response.
   - Communications Center determines that the patient's condition has changed, and requests you to upgrade to a hot (with lights and sirens) response.

7. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF:**
   - The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
   - The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
   - The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
   - Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.

8. Any EMS Dispatch Center Time delays resulting in a prolonged EMS Dispatch Center Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Dispatch Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.

9. All EMS Dispatch Delays will be reviewed regularly within the EMS System Peer Review Committee.

Standards Policy

EMS Wheels Rolling (Turn-Out) Time

Policy:

The EMS Wheels Rolling (Turn-out) Time will be less than 180 seconds, 90% of the time, for all events identified and classified as an emergent or hot (with lights and siren) response.

Definition:

The EMS Wheels Rolling (Turn-out) Time is defined as the time interval beginning with the time the EMS Dispatch Center notifies an EMS Unit to respond to a specific EMS event and ending with the time the EMS Unit is moving en route to the scene of the event.

Purpose:

The purpose of this policy is to:

- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. In EMS Dispatch Centers where Emergency Medical Dispatch (EMD) has been implemented, EMS Units will be dispatched by EMD certified personnel in accordance with the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.
2. The EMS Unit will acknowledge dispatch within 90 seconds. If a unit fails to check en route within 2:59 (mm:ss), the next available EMS unit will be dispatched.
3. Without question, exception, or hesitation, EMS Units will respond as dispatched (hot or cold). This includes both requests to respond on active calls and requests to "move-up" to cover areas of the System that have limited EMS resources available.
4. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF:**
   - The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
   - The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
   - The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
   - Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.
5. Any EMS Wheels Rolling (Turn-out) Time delay resulting in a prolonged EMS Response Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Response Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.
6. All EMS Response Delays will be reviewed regularly within the EMS System Peer Review Committee.

This policy has been altered from the original 2012 NCCEP Policy by the local EMS Medical Director

Infant Abandonment

Policy:

The North Carolina Infant Homicide Prevention Act provides a mechanism for unwanted infants to be taken under temporary custody by a law enforcement officer, social services worker, healthcare provider, or EMS personnel if an infant is presented by the parent within 7 days of birth. Emergency Medical Services will accept and protect infants who are presented to EMS in this manner, until custody of the child can be released to the Department of Social Services.

> *"A law enforcement officer, a department of social services worker, a health care provider as defined in G.S. 90-21.11 at a hospital or local or district health department, or an **emergency medical technician** at a fire station shall, without a court order, take into temporary custody an infant under 7 days of age that is voluntarily delivered to the individual by the infant's parent who does not express an intent to return for the infant. An individual who takes an infant into temporary custody under this subsection shall perform any act necessary to protect the physical health and well-being of the infant and shall immediately notify the department of social services. Any individual who takes an infant into temporary custody under this subsection may inquire as to the parents' identities and as to any relevant medical history, but the parent is not required to provide this information."*

Purpose:

To provide:

- Protection to infants that are placed into the custody of EMS under this law
- Protection to EMS systems and personnel when confronted with this issue

Procedure:

1. Initiate the Pediatric Assessment Procedure.
2. Initiate Newly Born Protocol as appropriate.
3. Initiate other treatment protocols as appropriate.
4. Keep infant warm.
5. Call local Department of Social Services or the county equivalent as soon as infant is stabilized.
6. Transport infant to medical facility as per local protocol.
7. Assure infant is secured in appropriate child restraint device for transport.
8. Document protocols, procedures, and agency notifications in the PCR.

Patient Without a Protocol

Policy:

Anyone requesting EMS services will receive a professional evaluation, treatment, and transportation (if needed) in a systematic, orderly fashion regardless of the patient's problem or condition.

Purpose:

- To ensure the provision of appropriate medical care for every patient regardless of the patient's problem or condition.

Procedure:

1. Treatment and medical direction for all patient encounters, which can be triaged into an EMS patient care protocol, is to be initiated by protocol.

2. When confronted with an emergency or situation that does not fit into an existing EMS patient care protocol, the patient should be treated by the **Universal Patient Care Protocol** and a **Medical Control Physician** should be contacted for further instructions.

Standards Policy

Physician on Scene

Policy:

The medical direction of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the rules and regulations of the state of North Carolina.

Purpose:

- To identify a chain of command to allow field personnel to adequately care for the patient
- To assure the patient receives the maximum benefit from prehospital care
- To minimize the liability of the EMS system as well as the on-scene physician

Procedure:

1. When a non medical-control physician offers assistance to EMS or the patient is being attended by a physician with whom they do not have an ongoing patient relationship, EMS personnel must review the On-Scene Physician Form with the physician. All requisite documentation must be verified and the physician must be approved by on-line medical control.

2. When the patient is being attended by a physician with whom they have an ongoing patient relationship, EMS personnel may follow orders given by the physician if the orders conform to current EMS guidelines, and if the physician signs the PCR. Notify medical control at the earliest opportunity. Any deviation from local EMS protocols requires the physician to accompany the patient to the hospital.

3. EMS personnel may accept orders from the patient's physician over the phone with the approval of medical control. The paramedic should obtain the specific order and the physician's phone number for relay to medical control so that medical control can discuss any concerns with the physician directly.

Standards Policy

State Poison Center

Policy:

The state poison center should be utilized by the 911 centers and the responding EMS services to obtain assistance with the prehospital triage and treatment of patients who have a potential or actual poisoning.

Purpose:

The purpose of this policy is to:

- Improve the care of patients with poisonings, envenomations, and environmental/biochemical terrorism exposures in the prehospital setting.
- Provide for the most timely and appropriate level of care to the patient, including the decision to transport or treat on the scene.
- Integrate the State Poison Center into the prehospital response for hazardous materials and biochemical terrorism responses

Procedure:

1. The 911 call center will identify and if EMD capable, complete key questions for the Overdose/ Poisoning, Animal Bites/Attacks, or Carbon Monoxide/Inhalation/HazMat emergency medical dispatch complaints and dispatch the appropriate EMS services and/or directly contact the State Poison Center for consultation.
2. If no immediate life threat or need for transport is identified, EMS personnel may conference the patient/caller with the Poison Center Specialist at the **State Poison Center at 800-222-1222**. If possible, dispatch personnel should remain on the line during conference evaluation.
3. The Poison Center Specialist at the State Poison Center will evaluate the exposure and make recommendations regarding the need for on-site treatment and/or hospital transport in a timely manner. If dispatch personnel are not on-line, the Specialist will recontact the 911 center and communicate these recommendations.
4. If the patient is determined to need EMS transport, the poison center Specialist will contact the receiving hospital and provide information regarding the poisoning, including treatment recommendations. EMS may contact medical control for further instructions or to discuss transport options.
5. If the patient is determined not to require EMS transport, personnel will give the phone number of the patient/caller to the Poison Center Specialist. The Specialist will initiate a minimum of one follow-up call to the patient/caller to determine the status of patient.
6. Minimal information that should be obtained from the patient for the state poison center includes:
    - Name and age of patient
    - Time of exposure
    - Signs and symptoms
    - Substance(s) involved
    - Any treatment given
7. Minimal information which should be provided to the state poison center for mass poisonings, including biochemical terrorism and HazMat, includes:
    - Substance(s) involved
    - Signs and symptoms
    - Time of exposure
    - Any treatment given

Standards Policy

Safe Transport of Pediatric Patients

Policy:

Without special considerations children are at risk of injury when transported by EMS. EMS must provide appropriate stabilization and protection to pediatric patients during EMS transport.

Purpose:

To provide:

- Provide a safe method of transporting pediatric patients within an ambulance.
- Protect the EMS system and personnel from potential harm and liability associated with the transportation of pediatric patients.

Procedure:

1. Drive cautiously at safe speeds observing traffic laws.
2. Tightly secure all monitoring devices and other equipment.
3. Insure that all pediatric patient less than 40 lbs are restrained with an approved child restraint device secured appropriately to the stretcher or captains chair.
3. Insure that all EMS personnel use the available restraint systems during the transport.
4. Transport adults and children who are not patients, properly restrained, in an alternate passenger vehicle, whenever possible.
5. Do not allow parents, caregivers, or other passengers to be unrestrained during transport.
6. NEVER attempt to hold or allow the parents or caregivers to hold the patient during transport.

Transport

Policy:

All individuals served by the EMS system will be evaluated, treated, and furnished transportation (if indicated) in the most timely and appropriate manner for each individual situation. Rowan County EMS should be considered for out of county transfers from local hospitals and medical facilities after other reasonable transport agencies have been exhausted. Rowan County EMS' primary mission is to give pre-hospital emergency care to the citizens of the county. Individuals calling for EMS services are considered unstable until and unless they receive an evaluation by qualified medical personnel.

Purpose:

To provide:

- Rapid emergency EMS transport when needed.
- Appropriate medical stabilization and treatment at the scene when necessary
- Protection of patients, EMS personnel, and citizens from undue risk when possible.

To maintain:

- The ability to care for prehospital medical emergencies occurring in the jurisdiction.

Procedure:

1. All trauma patients with significant mechanism or history for multiple system trauma will be transported as soon as possible. The scene time should be 10 minutes or less.

2. All acute Stroke and acute ST-Elevation Myocardial Infarction patients will be transported as soon as possible. The scene time should be 10 minutes or less for acute Stroke patients and 15 minutes or less (with 12 Lead ECG) for STEMI patients

3. Other Medical patients will be transported in the most efficient manner possible considering the medical condition. Advanced life support therapy should be provided at the scene if it would positively impact patient care. Justification for scene times greater than 20 minutes should be documented.

4. No patients will be transported in initial response non-transport vehicles.

5. In unusual circumstances, transport in other vehicles may be appropriate when directed by EMS administration.

6. The hospital should make arrangements with critical care transport services whenever possible for transports to out of county destinations. Critical care transport services have more personnel and equipment. These agencies are better able to handle complex, critical patients.

6. Rowan County will not approve ambulance transfers in severe and dangerous weather conditions. Such examples include icy roads, hail storms, high wind warnings and hurricanes.

7. When out of county transports cannot be avoided, only one EMS unit will generally be committed to any out of county assignment at a time.

8. When EMS is called for a transport, all of the patients medical records and transfer forms should be ready. This expedites the process for EMS and the patient.

9. Support personnel such as nurses or respiratory therapists should be available to assist EMS with critical patients.

10. Facilities that are required to provide transportation services for their respective clients should be utilized.

11. Supervisors will have discretion in managing any requests for EMS transportation.

Standards Policy

Rapid Sequence Induction

Policy:

Rapid Sequence Induction (RSI) requires an EMS System or Agency to follow these guidelines to ensure that this invasive procedure is performed in a safe and effective manner to benefit the citizens and guests of North Carolina.

Purpose:

The purpose of this policy is to:

- Ensure that the procedure is performed in a safe and effective manner
- Facilitate airway management in appropriate patients

Procedure:

1. In addition to other monitoring devices, waveform capnography and pulse oximetry are required to perform Drug-Assisted Intubation and must be monitored throughout the procedure.

2. Two EMT-Paramedics or higher-level providers must be present and participate in the airway management of the patient during the process.

3. All staff must be trained and signed off by the EMS Medical Director prior to performing Rapid Sequence Induction.

4. A printed copy or electronic download from the monitor defibrillator including the pulse oximetry, heart rhytm, waveform capnography, and blood pressure must be stored with the patient care report.

5. An EMS Airway Evaluation Form must be completed on all Rapid Sequence Induction attempts.

6. The EMS Airway Evaluation Form must be reviewed and signed by the EMS Medical Director within 7 days of the Rapid Sequence Induction.

7. All Rapid Sequence Inductions must be reviewed by the EMS System or Agency and issues identified addressed through the System Peer Review Committee.

8. A copy of the EMS Airway Evaluation Form for each Rapid Sequence Induction must be forwarded to the appropriate OEMS Regional Office at the end of each month for state review. Rowan County Emergency Services will forward the forms to the following:

   Western Regional Office
   3305-4 16th Avenue SE
   Conover, NC 28613
   Telephone: 828-466-5548
   Fax: 828-466-5651

Corrections to the Patient Care Report

Policy:

Supervisors will review all patient care reports for completeness and accuracy. Missing information and unclear or incomplete work will be corrected.

Purpose:

Specifically, reports will be audited for the information required in Policy 9, EMS Documentation and Data Quality. Supervisors will have employees correct or clarify missing or unclear information.

Procedure:

1. The supervisor will fill in missing information that can be pulled from other sources such as: the computer aided dispatch system, a hospital record or nursing facility paperwork.

2. Supervisors filling in missing facts or correcting verifiable information will be recorded electronically by the reporting software. Recorded information will include the changes, time and date. Acceptable changes for the supervisors to enter include adding missing zip codes, correcting addresses based on hospital information not available to the crew at the time of the trip or filling in call times from the dispatch sheet.

3. The EMT delivering patient care must correct any missing data or unclear information on patient assessments or treatment. The other EMT on the ambulance may assist if the primary attendant is unavailable to make corrections in a timely manner.

4. The author of the patient care report can add missing information as an addendum to the report.

5. Additional facts overlooked when the call was submitted should be submitted as a separate addendum.

6. Delayed entries and addendums will be electronically signed and dated by the reporting software.

7. Late entries may not change the substantial facts of the call or misrepresent in anyway the care.